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Division	Waste Management
Section	Superfund
Program	IHS (IHS)
DocCat	Facility

MEMORANDUM

CH2M HILL

TO: Jerry Henderson/ Du Pont

FROM: Doug Dronfield/ CH2M HILL

DATE: December 27, 1996

SUBJECT: Kentec Quarterly Groundwater Data and Monthly Railcar Data

Enclosed are the quarterly groundwater monitoring data results (August through October, 1996), the railcar concentrations, and monthly railcar average concentrations for the same time period (August through October, 1996). The submittal of this data to the state complies with Section II.2. of the June 17, 1992 Groundwater Remediation Permit.

The railcar data (effluent from the groundwater treatment plant) are well within the limits established by in the permit (Section I.27).

Kentec Quarterly Groundwater Data
October, 1996
All Concentrations are PPB

Well Number	Date	1,1-Dichloro-ethene	1,1-Dichloro-ethane	1,4-Dioxane
MW-1	Oct-96	< 7	< 7	<150
MW-3	Oct-96	7	< 7	<150
MW-4A	Oct-96	<7	<7	550
MW-4B	Oct-96	< 7	< 7	< 150
MW-6	Oct-96	< 7	< 7	1800
MW-7A	Oct-96	12	< 7	1800
MW-7B	Oct-96	< 7	< 7	< 150
MW-8	Oct-96	< 7	<7	< 150
MW-9	Oct-96	< 7	< 7	< 150
MW-10A	Oct-96	< 7	<7	< 150
MW-10B	Oct-96	< 7	< 7	< 150
MW-11A	Oct-96	< 7	<7	< 150
MW-11B	Oct-96	< 7	< 7	< 150
MW-12	Oct-96	< 7	< 7	< 150
MW-14A	Oct-96	< 7	<7	< 150
MW-14B	Oct-96	< 7	< 7	< 150
MW-15	Oct-96	< 7	<7	< 150
MW-16	Oct-96	< 7	< 7	< 150
MW-18	Oct-96	N\A	N\A	N\A
SW-11	Oct-96	< 7	< 7	< 150
SW-24	Oct-96	< 7	< 7	< 150
PS-2	Oct-96	< 7	18	< 150

Kentec Groundwater Treatment Facility
August - October, 1996
Railcar

Identification Code	Date	Time	DCE (ppb)	DCA (ppb)	1,4 Dioxane (ppb)
	August				
Railcar 94041	5	730	<5	<5	<100
Railcar 34064	7	730	<5	<5	<100
Railcar 94041	9	730	<5	<5	<100
Railcar 34064	12	730	<5	<5	<100
Railcar 34064	16	730	<5	<5	<100
Railcar 94041	19	730	<5	<5	<100
Railcar 34064	21	730	<5	<5	<100
Railcar 94041	23	730	<5	<5	<100
Railcar 34064	26	730	<5	<5	<100
Railcar 94041	28	730	<5	<5	<100
Railcar 34064	30	730	<5	<5	<100
Monthly Average			<5	<5	<100
	September				
Railcar 94041	3	730	<5	<5	<100
Railcar 34064	5	730	<5	<5	<100
Railcar 94041	16	730	<5	<5	<100
Railcar 34064	18	730	<5	<5	<100
Railcar 94041	20	730	<5	<5	<100
Railcar 34064	23	730	<5	<5	<100
Railcar 94041	25	730	<5	<5	<100
Railcar 34064	27	730	<5	<5	<100
Railcar 94041	30	730	<5	<5	<100
Monthly Average			<5	<5	<100
	October				
Railcar 34064	2	730	<5	<5	<100
Railcar 94041	4	730	<5	<5	<100
Railcar 34064	7	730	<5	<5	<100
Railcar 94041	9	730	<5	<5	<100
Railcar 34064	11	730	<5	<5	<100
Railcar 94041	14	730	<5	<5	<100
Railcar 34064	16	730	<5	<5	<100
Railcar 94041	18	730	<5	<5	<100
Railcar 94041	23	730	<5	<5	<100
Railcar 34064	25	730	<5	<5	<100
Railcar 94041	28	730	<5	<5	<100
Railcar 34064	30	730	<5	<5	<100
Monthly Average			<5	<5	<100

Kentec Groundwater Data
Water-Level Elevations
October 7, 1996
(Feet Above Mean Sea Level)

Monitoring Well Number	Groundwater/ Surface Water Elevation	Measuring Point Elevation
MW-1	23.82	31.22
MW-3	26.46	29.62
MW-4A	26.60	33.00
MW-4B	24.77	33.23
MW-6	24.84	30.71
MW-7A	24.93	30.18
MW-7B	24.93	30.53
MW-8	25.38	31.18
MW-9	26.63	32.78
MW-10A	26.48	33.10
MW-10B	23.91	32.43
MW-11A	26.22	32.82
MW-11B	24.39	33.11
MW-12	25.35	30.03
MW-14A	22.04	28.48
MW-14B	24.73	27.33
MW-15	23.76	28.96
MW-16	25.60	29.50
MW-18	NM	NM
Note:		
NM- Not measured.		
gwelv.xls		

IN eic/amR
cjw
File
Create File?

DuPont Fibers
P.O. Box 800
Kinston, North Carolina 28502-0800
Phone: (919) 522-6111

DUPONT
DuPont Dacron®

Kinston, North Carolina
October 4, 1996

RECEIVED
WASHINGTON OFFICE
OCT 07 1996
D. E. M.

Mr. Willie A. Hardison
Div. of Environmental Management
Groundwater Section
1424 Carolina Avenue
Washington, NC 27889

Subject: Permit No. WQ0005906
E. I. du Pont de Nemours & Co., Inc.
Kentec Site, SIC Code No. 7399
Groundwater Remediation System
Lenoir County

Dear Mr. Hardison:

Pursuant to the requirements of the subject permit, here are the data for the specified timeframes. If there are any questions, please give me a call on (919) 522-6263.

Sincerely,

J. D. Henderson / JKJ

J. D. Henderson, Manager
N.C. Environmental Affairs

JDH/jkj
Attachments

MEMORANDUM CH2M HILL

TO: Jerry Henderson/ Du Pont

FROM: Doug Dronfield/ CH2M HILL

DATE: August 28, 1996

SUBJECT: Kentec Quarterly Groundwater Data and Monthly Railcar Data

Enclosed are the quarterly groundwater monitoring data results (May through July, 1996), the railcar concentrations, and monthly railcar average concentrations for the same time period (May through July, 1996). The submittal of this data to the state complies with Section II.2. of the June 17, 1992 Groundwater Remediation Permit.

The railcar data (effluent from the groundwater treatment plant) are well within the limits established by in the permit (Section I.27).

Kentec Quarterly Groundwater Data
July, 1996
All Concentrations are PPB

Well Number	Date	1,1-Dichloro-ethene	1,1-Dichloro-ethane	1,4-Dioxane
MW-1	Jul-96	< 7	< 7	<150
MW-3	Jul-96	8	7	<150
MW-4A	Jul-96	<7	<7	390
MW-4B	Jul-96	< 7	< 7	< 150
MW-6	Jul-96	< 7	< 7	2200
MW-7A	Jul-96	13	< 7	930
MW-7B	Jul-96	< 7	< 7	< 150
MW-8	Jul-96	< 7	<7	< 150
MW-9	Jul-96	< 7	< 7	< 150
MW-10A	Jul-96	< 7	<7	< 150
MW-10B	Jul-96	< 7	< 7	< 150
MW-11A	Jul-96	< 7	<7	< 150
MW-11B	Jul-96	< 7	< 7	< 150
MW-12	Jul-96	< 7	< 7	< 150
MW-14A	Jul-96	< 7	<7	< 150
MW-14B	Jul-96	< 7	< 7	< 150
MW-15	Jul-96	< 7	<7	< 150
MW-16	Jul-96	< 7	< 7	< 150
MW-18	Jul-96	N\A	N\A	N\A
SW-11	Jul-96	< 7	< 7	< 150
SW-24	Jul-96	< 7	< 7	170
PS-2	Jul-96	8	35	< 150

Kentec Groundwater Treatment Facility
May - July, 1996
Railcar

Identification Code	Date	Time	DCE (ppb)	DCA (ppb)	1,4 Dioxane (ppb)
	May				
Railcar 34064	1	730	<5	<5	<100
Railcar 34064	6	730	<5	<5	<100
Railcar 94041	8	730	<5	<5	<100
Railcar 34064	10	730	<5	<5	<100
Railcar 34064	15	730	<5	<5	<100
Railcar 94041	22	730	<5	<5	<100
Railcar 34064	24	730	<5	<5	<100
Railcar 94041	28	730	<5	<5	<100
Railcar 34064	29	730	<5	<5	<100
Railcar 94041	31	730	<5	<5	<100
Monthly Average			<5	<5	<100
	June				
Railcar 94041	10	730	<5	<5	<100
Railcar 34064	12	730	<5	<5	<100
Railcar 94041	14	730	<5	<5	<100
Railcar 34064	17	730	<5	<5	<100
Railcar 94041	19	730	<5	<5	<100
Railcar 34064	21	730	<5	<5	<100
Railcar 94041	24	730	<5	<5	<100
Railcar 34064	26	730	<5	<5	<100
Railcar 94041	28	730	<5	<5	<100
Monthly Average			<5	<5	<100
	July				
Railcar 34064	1	730	<5	<5	<100
Railcar 94041	3	730	<5	<5	<100
Railcar 34064	5	730	<5	<5	<100
Railcar 94041	8	730	<5	<5	<100
Railcar 34064	10	730	<5	<5	<100
Railcar 94041	12	730	<5	<5	<100
Railcar 34064	17	730	<5	<5	<100
Railcar 94041	22	730	7	<5	<100
Railcar 34064	23	730	<5	<5	<100
Railcar 94041	26	730	<5	<5	<100
Railcar 34064	29	730	<5	<5	<100
Railcar 94041	31	730	<5	<5	<100
Monthly Average			5	<5	<100

Kentec Groundwater Data
Water-Level Elevations
July 23, 1996
(Feet Above Mean Sea Level)

Monitoring Well Number	Groundwater/ Surface Water Elevation	Measuring Point Elevation
MW-1	23.82	31.22
MW-3	26.75	29.62
MW-4A	26.89	33.00
MW-4B	23.73	33.23
MW-6	25.76	30.71
MW-7A	25.31	30.18
MW-7B	23.88	30.53
MW-8	26.55	31.18
MW-9	26.70	32.78
MW-10A	26.68	33.10
MW-10B	22.81	32.43
MW-11A	26.48	32.82
MW-11B	23.29	33.11
MW-12	25.61	30.03
MW-14A	22.08	28.48
MW-14B	23.59	27.33
MW-15	24.12	28.96
MW-16	25.65	29.50
MW-18	NM	NM
Note:		
NM- Not measured.		
gwelv.xls		

Dupont Fibers
Kinston, NC
JD Henderson - NC Envir. Affairs. (522-6263)
- Kentec Site - WQ0005906
GW Remed. System.

QMR - " Kentec Quarterly Groundwater Data - M'ly Rail Car Data
1. quarterly gw data - M - July
2. Rail Car Concentrations
3. M'ly average rail car Concentrations (Permit II. 2)

* Rail Car data is effluent from the GW Remediation System.
(Permit Sect I. 27)

1. Lab data = ?
2. TCE = ?
3. What EPA Method
4. Det. Limits for 1,4 Dioxane
5. wells
1, 3, 4A, 4B, 6, 7A, 7B; 8, 9, 10A, 10B, 11A, 11B
12, 14A, 14B, 15, 16, 18

(6). GW Contour Map + Concentrations Maps

Over

100X – Perm 1st Lns 12/27/91
Perm Exp 12/31/92

Sampling: Pond Abandoned
Closed out Remediation

FACILITIES

Facility: E. I. Dupont De Nemours & Co., Inc. (Kinston Site)
Owner or Contact Person: Mr. R.D. Ferguson, Plant Manager (Lenoir Co.)
Mailing Address: E.I. Dupont De Nemours & Co, Inc, P.O. Box 800
Kinston, N.C. 28502
County: Lenoir Telephone:
NPDES Permit No. NC00 Nondisc. Per. No. WQ0005906 (Pump & Haul)
Issue Date: 12/23/91 Expiration Date: 12/31/92
Existing Facility New Facility ✓
Rated By: Ed Warren Date: 4/6/92
Reviewed (Train. & Cert.) Reg. Office Ed Warren 4/6/92
Reviewed (Train. & Cert.) Central Office
ORC Grade O

Plant Class: (circle one) I II III IV Total Points 0 * See Comments

ITEM		POINTS
(1)	Industrial Pretreatment Units and/or Industrial Pretreatment Program (see definition No. 33)	4
(2)	DESIGN FLOW OF PLANT IN GPD (not applicable to non-contaminated cooling waters, sludge handling facilities for water purification plants, totally closed cycle systems (def. No. 11), and facilities consisting only of Item (4) (c) or Items (4) (d) and (11) (d))	
	0 -- 20,000	1
	20,001 -- 50,000	2
	50,001 -- 100,000	3
	100,001 -- 250,000	4
	250,001 -- 500,000	5
	500,001 --1,000,000	8
	1,000,001 -- 2,000,000	10
	2,000,001 (and up) - rate 1 point additional for each 200,000 gpd capacity up to a maximum of 30	
	Design Flow (gpd) : 720,000	
(3)	PRELIMINARY UNITS (see definition no. 32)	
	(a) Bar Screens	1
	or	
	(b) Mechanical Screens, Static Screens or Comminuting Devices	2
	(c) Grit Removal	1
	or	
	(d) Mechanical or Aerated Grit Removal	2
	(e) Flow Measuring Device	1
	or	
	(f) Instrumented Flow Measurement	2
	(g) Preaeration	2
	(h) Influent Flow Equalization	2
	(i) Grease or Oil Separators - Gravity	2
	Mechanical	3
	Dissolved Air Flotation	8
	(j) Prechlorination	5
(4)	PRIMARY TREATMENT UNITS	
	(a) Septic Tank (see definition no. 43)	2
	(b) Imhoff Tank	5
	(c) Primary Clarifiers	5
	(d) Settling Ponds or Settling Tanks for Inorganic Non-toxic Materials (sludge handling facilities for water purification plants, sand, gravel, stone, and other mining operations except recreational activities such as gem or gold mining)	2
(5)	SECONDARY TREATMENT UNITS	
	(a) Carbonaceous Stage	
	(i) Aeration - High Purity Oxygen System	20
	Diffused Air System	10
	Mechanical Air System (fixed, floating or rotor)	8
	Separate Sludge Reaeration	3
	(ii) Trickling Filter	
	High Rate	7
	Standard Rate	5
	Packed Tower	5
	(iii) Biological Aerated Filter or Aerated Biological Filter	10
	(iv) Aerated Lagoons	10
	(v) Rotating Biological Contactors	10
	(vi) Sand Filters-	
	intermittent biological	2
	recirculating biological	3
	(vii) Stabilization Lagoons	5
	(viii) Clarifier	5
	(ix) Single stage system for combined carbonaceous removal of BOD and nitrogenous removal by nitrification (see def. No. 12) (Points for this item have to be in addition to items (5) (a) (i) through (5) (a) (viii)	8
	(x) Nutrient additions to enhance BOD removal	5
	(xi) Biological Culture ("Super Bugs") addition to enhance organic compound removal	5
	(b) Nitrogenous Stage	
	(i) Aeration - High Purity Oxygen System	20
	Diffused Air System	10
	Mechanical Air System (fixed, floating, or rotor)	8
	Separate Sludge Reaeration	3
	(ii) Trickling Filter -	
	High Rate	7
	Standard Rate	5
	Packed Tower	5
	(iii) Biological Aerated Filter or Aerated Biological Filter	10
	(iv) Rotating Biological Contactors	10
	(v) Sand Filter-	
	intermittent biological	2
	recirculating biological	3
	(vi) Clarifier	5

(6) TERTIARY OR ADVANCED TREATMENT UNIT

(a) Activated Carbons Beds -
- without carbon regeneration 5
- with carbon regeneration 15

(b) Powdered or Granular Activated Carbon Feed -
- without carbon regeneration 5
- with carbon regeneration 15

(c) Air Stripping 5

(d) Denitrification Process (separate process) 10

(e) Electrodialysis 5

(f) Foam Separation 5

(g) Ion Exchange 5

(h) Land Application of Treated Effluent (see definition no. 22b) (not applicable for sand, gravel, stone and other similar mining operations)
- (i) on agriculturally managed sites (See def. No. 4) 10
- (ii) by high rate infiltration on non-agriculturally managed sites (includes rotary distributors and similar fixed nozzle systems) 4
- (iii) by subsurface disposal (includes low pressure pipe systems and gravity systems except at plants consisting of septic tank and nitrification lines only) 4

(i) Microscreens 5

(j) Phosphorus Removal by Biological Processes (See def. No. 26) 20

(k) Polishing Ponds - without aeration ..... 2; with aeration 5

(l) Post Aeration - cascade ..... 0; diffused or mechanical ... 5

(m) Reverse Osmosis 5

(n) Sand or Mixed-Media Filters - low rate ..... 2; high rate 5

(o) Treatment processes for removal of metal or cyanide 15

(p) Treatment processes for removal of toxic materials other than metal or cyanide 15

SLUDGE TREATMENT

(a) Sludge Digestion Tank - Heated ..... 10; Aerobic ..... 5; Unheated 3

(b) Sludge Stabilization (chemical or thermal) 5

(c) Sludge Drying Beds - Gravity ..... 2; Vacuum Assisted 5

(d) Sludge Elutriation 5

(e) Sludge Conditioner (chemical or thermal) 5

(f) Sludge Thickener (gravity) 5

(g) Dissolved Air Flotation Unit (not applicable to a unit rates as (3) (i) 8

(h) Sludge Gas Utilization (including gas storage) 2

(i) Sludge Holding Tank - Aerated ..... 5; Non-aerated 2

(j) Sludge Incinerator - (not including activated carbon regeneration) 10

(k) Vacuum Filter, Centrifuge or Filter Press or other similar dewatering devices 10

(8) SLUDGE DISPOSAL (including incinerated ash)

(a) Lagoons 2

(b) Land Application (surface and subsurface) (see definition 22a)
- -where the facility holds the land app. permit ... 10
- -by contracting to a land application operator who holds the land application permit 2
- -land application of sludge by a contractor who does not hold the permit for the wastewater treatment facility where the sludge is generated 10

(c) Landfilled (burial) 5

(9) DISINFECTION

(a) Chlorination 5

(b) Dechlorination 5

(c) Ozone 5

(d) Radiation 5

(10) CHEMICAL ADDITION SYSTEM (S) (See definition No. 9) (not applicable to chemical additions rated as item (3) (j), (5) (a) (xi), (6) (a), (6) (b), (7) (b), (7) (e), (9) (a), (9) (b), or (9) (c) 5 points each: List:

_____ .....
_____ .....
_____ .....
_____ .....

(11) MISCELLANEOUS UNITS

(a) Holding Ponds, Holding Tanks or Settling Ponds for Organic or Toxic Materials including wastes from mining operations containing nitrogen and/or phosphorous compounds in amounts significantly greater than is common for domestic wastewater .....

(b) Effluent Flow Equalization (not applicable to storage basins which are inherent in land application systems).

(c) Stage Discharge (not applicable to storage basins inherent in land application systems.....

(d) Pumps.....

(e) Stand-By Power Supply.....

(f) Thermal Pollution Control Device.....

TOTAL POINTS _____

CLASSIFICATION

Class I.....	5 - 25 Points
Class II.....	26- 50 Points
Class III.....	51- 65 Points
Class IV.....	66- Up Points

Facilities having a rating of one through four points, inclusive, do not require a certified operator. Classification of all other facilities requires a comparable grade operator in responsible charge.

Facilities having an activated sludge process will be assigned a minimum classification of Class II.

Facilities having treatment processes for the removal of metal or cyanide will be assigned a minimum classification of Class II.

Facilities having treatment processes for the biological removal of phosphorus will be assigned a minimum classification of Class III.

In-plant processes and related control equipment which are an integral part of industrial production shall not be considered waste treatment. Likewise, discharges of wastewater from residences having a design flow of 1,000 gpd or less, shall not be subject to rating.

ADDITIONAL COMMENTS:

This is a pretreatment facility owned by Dupont which will be discharging via a pump and haul operation to the Dupont, Kinston WWTP (NC0003760).

The facility referenced in permit No. WQ0005906 is an industrial pretreatment unit as defined in definition No. 33 and should be rated as part of the Dupont, Kinston WWTP (NC0003760).

WaRO

WASHINGTON REGIONAL OFFICE

April 6, 1992

MEMORANDUM

TO: Mrs. Cindy Finan, Supervisor
Operator Training and Certification

THRU: Roger Thorpe, WQ Supervisor
Washington Regional Office

FROM: Ed Warren, WWTP Consultant
Washington Regional Office

Subject: Facility Classification
E. I. Dupont de Nemours & Co., Inc. (Kentec Site)
WQ0005906 (Pump & Haul)
Lenoir County

A rating scale for the subject facility is enclosed. Since the permit is for a "Pump & Haul" facility, the plant will not be classified.

However, it is our opinion that this facility should be treated as a pretreatment facility for the Dupont, Kinston discharging facility (NPDES No. NC0003760) since that is where the effluent from the facility will be hauled to undergo further treatment. Therefore, it may affect the classification of NC0003760. A rating sheet for NC0003760 will be prepared and forwarded to you in the near future.

If you have questions or need additional information, please let us know.

Enclosure
cc: Files

EW/wp51/disk1/memorat.dup

WARO

DIVISION OF ENVIRONMENTAL MANAGEMENT

May 8, 1987

MEMORANDUM

TO: Arthur Mouberry, Supervisor
Permits and Engineering

THROUGH: Jim Mulligan, Regional Supervisor
Washington Regional Office

THROUGH: Roger K. Thorpe, Water Quality Supervisor
Washington Regional Office

FROM: Alton R. Hodge, Environmental Engineer
Water Quality Section, Washington Regional Office

SUBJECT: Permit Amendment Request
No. 12725
E. I. DuPont de Nemours
Kentec, Inc.
Pump and Haul
Lenoir County

Mr. James C. Hobbs of DuPont has submitted a permit amendment request in the form of two letters dated April 23, 1987, and April 27, 1987.

Kentec, Inc., is a small company owned by DuPont which cleans metal parts used in the manufacture of polyester fibers. Their wastewater consists of triethylene glycol (TEG), titanium dioxide (TiO_2), and water. After Kentec's initial wastewater treatment system proved inadequate a request for a temporary pump and haul permit, No. 12725, was granted. That permit allows Kentec to transport all its waste-water wastewater approximately two miles by tanker truck to the DuPont, Kinston plant, where the wastewater is placed in railroad tanker cars and shipped to a DuPont treatment plant at Deepwater, New Jersey. Permit No. 12725 requires the submittal of plans and specifications for a more environmentally sound method of wastewater treatment to be submitted. That condition of the permit has been satisfied with approved plans to be issued for the construction of a rail spur to the existing Kentec plant site where Kentec's wastewater could be loaded directly on rail cars and shipped to the DuPont plant at Deepwater, New Jersey. New Jersey state officials were contacted and had no problem with Kentec's proposal.

Kentec recently had a 50 gallon spill of TEG which was reported promptly and cleaned up quickly. However, because of the press coverage, DuPont officials perceived the spill as a "black eye" and originated the subject request.

The permit amendment request asks for a revised permit which would allow:

1) Additional time to conduct a feasibility study. The study would determine the feasibility of relocating the Kentec plant to a more secure site, possibly to the Kinston plant site.

2) If the study determined it possible to relocate Kentec, additional time for plans, permits, and construction (18 months), would be needed.

3) If the study determined it uneconomical to relocate, additional time to construct the already approved plan at the present Kentec site would be needed.

With either alternative, the wastewater would be shipped by rail, in a controlled environment, to the DuPont plant at Deepwater, New Jersey.

DuPont offers the following time schedule with the permit amendment request to:

a) Submit findings of feasibility study to the Division, by August 31, 1987.

b) Remain at present location, complete construction by November 30, 1987.

c) Relocate facility, complete construction by March 1, 1989.

Considering the short distance of highway transport, approximately two miles, and the increased security of possibly relocating Kentec to the Kinston plant site, it is recommended DuPont's request be granted. It is also recommended that the following condition be included in the revised permit.

I. In the event E.I. duPont de Nemours and Comapny, Inc., fails to comply with the complete construction dates, a thousand dollars ($1000) a day penalty shall be paid to the North Carolina Department of Natural Resources Community Development until such time as the construction is completed in accordance with approved plans and specifications.

This condition has been discussed with DuPont. DuPont has agreed to accept this condition and not adjudicate the permit.

ARH/ekw

R-12003-K REV. 8-90

DUPONT
REG US PAT & TM OFF
ESTABLISHED 1802

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
KINSTON PLANT
P.O. BOX 800
KINSTON, NORTH CAROLINA 28502-0800
PHONE (919) 522-6111

FIBERS DEPARTMENT

Kinston, North Carolina
July 12, 1996

Mr. Willie A. Hardison
Div. of Environmental Management
Groundwater Section
1424 Carolina Avenue
Washington, NC 27889

Subject: Permit No. WQ0005906
E. I. du Pont de Nemours & Co., Inc.
Kentec Site, SIC Code No. 7399
Groundwater Remediation System
Lenoir County

Dear Mr. Hardison:

Pursuant to the requirements of the subject permit, here are the data for the specified timeframes. If there are any questions, please give me a call on (919) 522-6263.

Sincerely,

J. D. Henderson, Manager
N.C. Environmental Affairs

JDH/jkj
Attachments

Kentec Quarterly Groundwater Data and Monthly Railcar Data

TO: Jerry Henderson/DuPont

FROM: Doug Dronfield/CH2M HILL

DATE: July 8, 1996

Enclosed are the quarterly groundwater monitoring data results (February, 1996 through April, 1996), the railcar concentrations, and monthly railcar average concentrations for the same time period (February, 1996 through April, 1996). The submittal of this data to the state complies with Section II.2. of the June 17, 1992 Groundwater Remediation Permit.

The railcar data (effluent from the groundwater treatment plant) are well within the limits established by the permit (Section I.27).

Kentec Quarterly Groundwater Data
April, 1996
All Concentrations are PPB

Well Number	Date	1,1-Dichloro-ethene	1,1-Dichloro-ethane	1,4-Dioxane
MW-1	Apr-96	< 7	< 7	160
MW-3	Apr-96	18	7	230
MW-4A	Apr-96	<7	<7	630
MW-4B	Apr-96	< 7	< 7	< 150
MW-6	Apr-96	< 7	< 7	3600
MW-7A	Apr-96	<7	< 7	480
MW-7B	Apr-96	< 7	< 7	< 150
MW-8	Apr-96	< 7	<7	< 150
MW-9	Apr-96	< 7	< 7	< 150
MW-10A	Apr-96	< 7	<7	< 150
MW-10B	Apr-96	< 7	< 7	< 150
MW-11A	Apr-96	< 7	<7	< 150
MW-11B	Apr-96	< 7	< 7	< 150
MW-12	Apr-96	< 7	< 7	< 150
MW-14A	Apr-96	< 7	<7	< 150
MW-14B	Apr-96	< 7	< 7	< 150
MW-15	Apr-96	< 7	<7	< 150
MW-16	Apr-96	< 7	< 7	< 150
MW-18	Apr-96	N\A	N\A	N\A
SW-11	Apr-96	< 7	< 7	< 150
SW-24	Apr-96	< 7	< 7	< 150
PS-2	Apr-96	< 7	10	< 150

Kentec Groundwater Treatment Facility
February - April, 1996
Railcar

Identification Code	Date	Time	DCE (ppb)	DCA (ppb)	1,4 Dioxane (ppb)
	February				
Railcar 34064	2	730	<5	<5	<100
Railcar 94041	6	730	<5	<5	<100
Railcar 34064	9	730	<5	<5	<100
Railcar 94041	12	730	<5	<5	<100
Railcar 34064	14	730	<5	<5	<100
Railcar 94041	16	730	<5	<5	<100
Railcar 94041	21	730	<5	<5	<100
Railcar 34064	23	730	<5	<5	<100
Railcar 94041	26	730	<5	<5	<100
Railcar 34064	28	730	<5	<5	<100
Monthly Average			<5	<5	<100
	March				
Railcar 34064	4	730	<5	<5	<100
Railcar 94041	6	730	<5	<5	<100
Railcar 34064	8	730	<5	<5	<100
Railcar 94041	11	730	<5	<5	<100
Railcar 34064	13	730	<5	<5	<100
Railcar 94041	15	730	<5	<5	<100
Railcar 34064	18	730	<5	<5	<100
Railcar 94041	20	730	<5	<5	<100
Railcar 94041	25	730	<5	<5	<100
Railcar 94041	29	730	<5	<5	<100
Monthly Average			<5	<5	<100
	April				
Railcar 34064	1	730	<5	<5	<100
Railcar 94041	3	730	<5	<5	<100
Railcar 94041	9	730	<5	<5	<100
Railcar 94041	15	730	<5	<5	<100
Railcar 34064	17	730	<5	<5	<100
Railcar 94041	19	730	<5	<5	<100
Railcar 94041	24	730	<5	<5	<100
Railcar 34064	26	730	<5	<5	<100
Railcar 94041	29	730	<5	<5	<100
Monthly Average			<5	<5	<100

Kentec Groundwater Data
Water-Level Elevations
April 22, 1996
(Feet Above Mean Sea Level)

Monitoring Well Number	Groundwater/ Surface Water Elevation	Measuring Point Elevation
MW-1	23.82	31.22
MW-3	26.22	29.62
MW-4A	26.33	33.00
MW-4B	24.18	33.23
MW-6	25.16	30.71
MW-7A	24.71	30.18
MW-7B	24.40	30.53
MW-8	26.06	31.18
MW-9	26.40	32.78
MW-10A	26.25	33.10
MW-10B	23.43	32.43
MW-11A	26.01	32.82
MW-11B	23.86	33.11
MW-12	25.15	30.03
MW-14A	21.92	28.48
MW-14B	24.23	27.33
MW-15	23.36	28.96
MW-16	25.13	29.50
MW-18	NM	NM
Note:		
NM- Not measured.		
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E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
KINSTON PLANT
P.O. BOX 800
KINSTON, NORTH CAROLINA 28502-0800
PHONE (919) 522-6111

FIBERS DEPARTMENT

Kinston, North Carolina
February 23, 1996

Mr. Willie A. Hardison
Div. of Environmental Management
Groundwater Section
1424 Carolina Avenue
Washington, NC 27889

Subject: Permit No. WQ0005906
E. I. du Pont de Nemours & Co., Inc.
Kentec Site, SIC Code No. 7399
Groundwater Remediation System
Lenoir County

Dear Mr. Hardison:

Pursuant to the requirements of the subject permit, here are the data for the specified timeframes. If there are any questions, please give me a call on (919) 522-6263.

Sincerely,

J. D. Henderson/jkj

J. D. Henderson, Manager
N.C. Environmental Affairs

JDH/jkj
Attachments

MEMORANDUM CH2M HILL

TO: Jerry Henderson/ Du Pont

FROM: Doug Dronfield/ CH2M HILL

DATE: February 7, 1996

SUBJECT: Kentec Quarterly Groundwater Data and Monthly Railcar Data

Enclosed are the quarterly groundwater monitoring data results (November, 1995 through January, 1996), the railcar concentrations, and monthly railcar average concentrations for the same time period (November, 1995 through January, 1996). The submittal of this data to the state complies with Section II.2. of the June 17, 1992 Groundwater Remediation Permit.

The railcar data (effluent from the groundwater treatment plant) are well within the limits established by in the permit (Section I.27).

Kentec Quarterly Groundwater Data
January, 1996
All Concentrations are PPB

Well Number	Date	1,1-Dichloro-ethene	1,1-Dichloro-ethane	1,4-Dioxane
MW-1	Jan-96	< 7	< 7	< 150
MW-3	Jan-96	44	7	380
MW-4A	Jan-96	<7	<7	910
MW-4B	Jan-96	< 7	< 7	< 150
MW-6	Jan-96	< 7	11	5300
MW-7A	Jan-96	<7	< 7	150
MW-7B	Jan-96	< 7	< 7	< 150
MW-8	Jan-96	< 7	<7	< 150
MW-9	Jan-96	< 7	< 7	< 150
MW-10A	Jan-96	< 7	<7	< 150
MW-10B	Jan-96	< 7	< 7	< 150
MW-11A	Jan-96	< 7	<7	< 150
MW-11B	Jan-96	< 7	< 7	< 150
MW-12	Jan-96	< 7	< 7	< 150
MW-14A	Jan-96	< 7	<7	< 150
MW-14B	Jan-96	< 7	< 7	< 150
MW-15	Jan-96	< 7	<7	< 150
MW-16	Jan-96	< 7	< 7	< 150
MW-18	Jan-96	N\A	N\A	N\A
SW-11	Jan-96	< 7	< 7	< 150
SW-24	Jan-96	< 7	< 7	< 150
PS-2	Jan-96	< 7	< 7	< 150

Kentec Groundwater Treatment Facility
November, 1995 - January, 1996
Railcar

Identification Code	Date	Time	DCE (ppb)	DCA (ppb)	1,4 Dioxane (ppb)
	November				
Railcar 34064	1	730	<5	<5	<100
Railcar 34064	6	730	<5	<5	<100
Railcar 94041	8	730	<5	<5	<100
Railcar 34064	10	730	<5	<5	<100
Railcar 94041	13	730	<5	<5	<100
Railcar 34064	15	730	<5	<5	<100
Railcar 94041	17	730	<5	<5	<100
Railcar 94041	22	730	<5	<5	<100
Railcar 34064	27	730	<5	<5	<100
Railcar 94041	29	730	<5	<5	<100
Monthly Average			<5	<5	<100
	December				
Railcar 34064	1	730	<5	<5	<100
Railcar 94041	4	730	<5	<5	<100
Railcar 34064	6	730	<5	<5	<100
Railcar 94041	8	730	<5	<5	<100
Railcar 94041	13	730	<5	<5	<100
Railcar 34064	15	730	<5	<5	<100
Railcar 94041	18	730	<5	<5	<100
Railcar 34064	20	730	<5	<5	<100
Railcar 94041	22	730	<5	<5	<100
Railcar 34064	27	730	<5	<5	<100
Railcar 94041	29	730	<5	<5	<100
Monthly Average			<5	<5	<100
	January				
Railcar 34064	2	730	<5	<5	<100
Railcar 94041	3	730	<5	<5	<100
Railcar 34064	5	730	<5	<5	<100
Railcar 94041	8	730	<5	<5	<100
Railcar 34064	10	730	<5	<5	<100
Railcar 94041	12	730	<5	<5	<100
Railcar 34064	19	730	<5	<5	<100
Railcar 94041	22	730	<5	<5	<100
Railcar 34064	24	730	<5	<5	<100
Railcar 94041	26	730	<5	<5	<100
Railcar 34064	29	730	<5	<5	<100
Railcar 94041	31	730	<5	<5	<100
Monthly Average			<5	<5	<100

Kentec Groundwater Data
Water-Level Elevations
January 16, 1996
(Feet Above Mean Sea Level)

Monitoring Well Number	Groundwater/ Surface Water Elevation	Measuring Point Elevation
MW-1	23.82	31.22
MW-3	25.36	29.62
MW-4A	25.42	33.00
MW-4B	23.53	33.23
MW-6	24.08	30.71
MW-7A	24.77	30.18
MW-7B	23.70	30.53
MW-8	25.55	31.18
MW-9	25.75	32.78
MW-10A	25.37	33.10
MW-10B	22.68	32.43
MW-11A	25.04	32.82
MW-11B	23.09	33.11
MW-12	25.48	30.03
MW-14A	22.32	28.48
MW-14B	23.46	27.33
MW-15	23.66	28.96
MW-16	24.70	29.50
MW-18	NM	NM
Note: NM- Not measured.		

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EXTERNAL AFFAIRS
150 Fayetteville Street Mall, Suite 2210
Raleigh, North Carolina 27601
Phone: (919) 834-8398
Fax: (919) 828-2707

January 16, 1996

Mr. Willie A. Hardison
Div. Of Environmental Management
Groundwater Section
1424 Carolina Avenue
Washington, NC 27889

SUBJECT: Permit No. WQ0005906
E. I. Du Pont de Nemours & Co., Inc.
Kentec Site, SIC Code No. 7399
Groundwater Remediation System
Lenoir County

Dear Mr. Hardison:

Pursuant to the requirements of the subject permit, here are the data for the specified timeframes. If there are any questions, please give me a call on (919) 522-6263.

Sincerely,

J. D. Henderson

J. D. Henderson, Manager
NC Environmental Affairs

JDH:jmw

Attachments

MEMORANDUM

CH2M HILL

TO: Jerry Henderson/ Du Pont

FROM: Doug Dronfield/ CH2M HILL

DATE: December 28, 1995

SUBJECT: Kentec Quarterly Groundwater Data and Monthly Railcar Data

Enclosed are the quarterly groundwater monitoring data results (August through October, 1995), the railcar concentrations, and monthly railcar average concentrations for the same time period (August through October, 1995). The submittal of this data to the state complies with Section II.2. of the June 17, 1992 Groundwater Remediation Permit.

The railcar data (effluent from the groundwater treatment plant) are well within the limits established by in the permit (Section I.27).

Kentec Quarterly Groundwater Data
October, 1995
All Concentrations are PPB

Well Number	Date	1,1-Dichloro-ethene	1,1-Dichloro-ethane	1,4-Dioxane
MW-1	Oct-95	< 7	< 7	300
MW-3	Oct-95	41	49	360
MW-4A	Oct-95	7.2	<7	650
MW-4B	Oct-95	< 7	< 7	< 150
MW-6	Oct-95	< 7	11	4500
MW-7A	Oct-95	<7	< 7	320
MW-7B	Oct-95	< 7	< 7	< 150
MW-8	Oct-95	< 7	<7	180
MW-9	Oct-95	< 7	< 7	< 150
MW-10A	Oct-95	< 7	<7	< 150
MW-10B	Oct-95	< 7	< 7	< 150
MW-11A	Oct-95	< 7	<7	< 150
MW-11B	Oct-95	< 7	< 7	< 150
MW-12	Oct-95	< 7	< 7	< 150
MW-14A	Oct-95	< 7	<7	410
MW-14B	Oct-95	< 7	< 7	< 150
MW-15	Oct-95	< 7	<7	< 150
MW-16	Oct-95	< 7	< 7	< 150
MW-18	Oct-95	N\A	N\A	N\A
SW-11	Oct-95	< 7	< 7	< 150
SW-24	Oct-95	< 7	< 7	< 150
PS-2	Oct-95	10	52	< 150

Kentec Groundwater Treatment Facility
August - October, 1995
Railcar

Identification Code	Date	Time	DCE (ppb)	DCA (ppb)	1,4 Dioxane (ppb)
	August				
Railcar 94041	2	730	<5	<5	<100
Railcar 34064	3	730	<5	<5	<100
Railcar 94041	7	730	<5	<5	<100
Railcar 34064	9	730	<5	<5	<100
Railcar 94041	11	730	<5	<5	<100
Railcar 34064	14	730	<5	<5	<100
Railcar 94041	16	730	<5	<5	<100
Railcar 34064	18	730	<5	<5	<100
Railcar 94041	21	730	<5	<5	<100
Railcar 34064	23	730	<5	<5	<100
Railcar 94041	25	730	<5	<5	<100
Railcar 34064	28	730	<5	<5	<100
Railcar 94041	30	730	<5	<5	<100
Monthly Average			<5	<5	<100
	September				
Railcar 34064	1	730	<5	<5	<100
Railcar 94041	5	730	<5	<5	<100
Railcar 34064	8	730	<5	<5	<100
Railcar 94041	11	730	<5	<5	<100
Railcar 34064	13	730	<5	<5	<100
Railcar 94041	15	730	<5	<5	<100
Railcar 34064	18	730	<5	<5	<100
Railcar 94041	20	730	<5	<5	<100
Railcar 34064	22	730	<5	<5	<100
Railcar 94041	25	730	<5	<5	<100
Railcar 34064	27	730	<5	<5	<100
Railcar 94041	29	730	<5	<5	<100
Monthly Average			<5	<5	<100
	October				
Railcar 34064	2	730	<5	<5	<100
Railcar 94041	4	730	<5	<5	<100
Railcar 34064	6	730	<5	<5	<100
Railcar 94041	9	730	<5	<5	<100
Railcar 34064	11	730	<5	<5	<100
Railcar 94041	13	730	<5	<5	<100
Railcar 34064	16	730	<5	<5	<100
Railcar 94041	18	730	<5	<5	<100
Railcar 34064	23	730	<5	<5	<100
Railcar 94041	25	700	<5	<5	<100
Railcar 34064	27	730	<5	<5	<100
Monthly Average			<5	<5	<100

Kentec Groundwater Data
Water-Level Elevations
October 9, 1995
(Feet Above Mean Sea Level)

Monitoring Well Number	Groundwater/ Surface Water Elevation
MW-1	23.82
MW-3	23.86
MW-4A	23.82
MW-4B	21.68
MW-6	22.93
MW-7A	24.03
MW-7B	21.81
MW-8	23.58
MW-9	23.38
MW-10A	23.58
MW-10B	20.88
MW-11A	24.02
MW-11B	21.28
MW-12	24.70
MW-14A	21.28
MW-14B	21.60
MW-15	21.66
MW-16	23.65
MW-18	23.73

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Willie Hardison

DIVISION OF ENVIRONMENTAL MANAGEMENT

GROUNDWATER SECTION

January 2, 1996

MEMORANDUM

To: Carolyn McCaskill

Through: Bob Cheek

From: David Goodrich

Subject: E. I. DuPont - Kentec Facility
Non-Discharge Permit Application
Wastewater Recycling System
Lenoir County
WQ0011757/GW95264
(John Seymour: DEM SERG Review Engineer)

The Groundwater Section has reviewed the subject permit application for the operation of a wastewater recycling system which will allow reuse of the wastewater generated from the cleaning of metal parts used in the manufacture of polyester fabrics. The wastewater generated from this process has historically been stored in a railcar and transported to a treatment facility in New Jersey under Pump and Haul Permit No. WQ0005394. New technology, in the form of a crossflow membrane filtration system and a spiral wound reverse osmosis system, allows 80 to 90% of the wastewater to be reused (on-site). The wastewater which cannot be recycled will continue to be sent to the treatment facility in New Jersey.

Neither the existing nor the proposed treatment methodologies result in any discharge of the wastewater to surface water, land surface, or ground water at the facility. The course of action proposed by the applicant, as presented in the application package, will not contact groundwater and will therefore have no impact on the quality of the groundwater beneath the facility.

The Groundwater Section has no objections to the issuance of this permit.

If there are any questions please let me know.

cc: Willie Hardison
Permit Files
--DUPONTKE--

EXTERNAL AFFAIRS
150 Fayetteville Street Mall, Suite 2210
Raleigh, North Carolina 27601
Phone: (919) 834-8398
Fax: (919) 828-2707

October 6, 1995

Mr. Willie A. Hardison
Div. Of Environmental Management
Groundwater Section
1424 Carolina Avenue
Washington, NC 27889

RE: Permit No. WQ0005906
E. I. DuPont de Nemours & Co., Inc.
Kentec Site, SIC Code No. 7399
Groundwater Remediation System
Lenior County

Dear Mr. Hardison:

Pursuant to the requirements of the subject permit, here are the data for the specified timeframes. If there are any questions, please give me a call on (919) 834-8398.

Sincerely,

Jerry D. Henderson

J. D. Henderson, Manager
N.C. Environmental Affairs

JDH:jmw

Attachments

MEMORANDUM

CH2M HILL

TO: Jerry Henderson/ Du Pont

FROM: Doug Dronfield/ CH2M HILL

DATE: August 25, 1995

SUBJECT: Kentec Quarterly Groundwater Data and Monthly Railcar Data

Enclosed are the quarterly groundwater monitoring data results (May through July, 1995), the railcar concentrations, and monthly railcar average concentrations for the same time period (May through July, 1995). The submittal of this data to the state complies with Section II.2. of the June 17, 1992 Groundwater Remediation Permit.

The railcar data (effluent from the groundwater treatment plant) are well within the limits established by in the permit (Section I.27).

Kentec Quarterly Groundwater Data
July, 1995
All Concentrations are PPB

Well Number	Date	1,1-Dichloro-ethene	1,1-Dichloro-ethane	1,4-Dioxane
MW-1	Jul-95	< 7	< 7	200
MW-3	Jul-95	13	<7	280
MW-4A	Jul-95	7.2	<7	1000
MW-4B	Jul-95	< 7	< 7	< 150
MW-6	Jul-95	< 7	11	4000
MW-7A	Jul-95	<7	< 7	840
MW-7B	Jul-95	< 7	< 7	< 150
MW-8	Jul-95	< 7	<7	190
MW-9	Jul-95	< 7	< 7	< 150
MW-10A	Jul-95	< 7	<7	< 150
MW-10B	Jul-95	< 7	< 7	< 150
MW-11A	Jul-95	< 7	8.6	< 150
MW-11B	Jul-95	< 7	< 7	< 150
MW-12	Jul-95	< 7	< 7	< 150
MW-14A	Jul-95	< 7	<7	240
MW-14B	Jul-95	< 7	< 7	< 150
MW-15	Jul-95	< 7	<7	< 150
MW-16	Jul-95	< 7	< 7	< 150
MW-18	Jul-95	N\A	N\A	N\A
SW-11	Jul-95	< 7	< 7	< 150
SW-24	Jul-95	< 7	< 7	< 150
PS-2	Jul-95	25	100	< 150

Kentec Groundwater Treatment Facility
May - July, 1995
Railcar

Identification Code	Date	Time	DCE (ppb)	DCA (ppb)	1,4 Dioxane (ppb)
	May				
Railcar 34064	1	730	<5	<5	<100
Railcar 34064	5	730	<5	<5	<100
Railcar 94041	8	730	<5	<5	<100
Railcar 34064	10	730	<5	<5	<100
Railcar 94041	12	730	<5	<5	<100
Railcar 34064	19	730	<5	<5	<100
Railcar 94041	22	730	<5	<5	<100
Railcar 34064	19	730	<5	<5	<100
Railcar 94041	22	730	<5	<5	<100
Railcar 34064	24	730	<5	<5	<100
Railcar 94041	26	730	<5	<5	<100
Railcar 34064	30	730	<5	<5	<100
Railcar 94041	31	730	<5	<5	<100
Monthly Average			<5	<5	<100
	June				
Railcar 34064	2	730	<5	<5	<100
Railcar 94041	5	730	<5	<5	<100
Railcar 34064	7	730	<5	<5	<100
Railcar 94041	12	730	<5	<5	<100
Railcar 34064	14	730	<5	<5	<100
Railcar 94041	16	730	<5	<5	<100
Railcar 34064	19	730	<5	<5	<100
Railcar 94041	21	730	<5	<5	<100
Railcar 34064	23	730	<5	<5	<100
Railcar 94041	26	730	<5	5	<100
Railcar 34064	28	730	<5	<5	<100
Railcar 94041	30	730	<5	<5	<100
Monthly Average			<5	5	<100
	July				
Railcar 34064	3	730	<5	<5	<100
Railcar 94041	7	730	<5	<5	<100
Railcar 34064	10	730	<5	<5	<100
Railcar 94041	12	730	<5	<5	<100
Railcar 34064	17	730	<5	<5	<100
Railcar 94041	19	730	<5	<5	<100
Railcar 34064	21	730	<5	<5	<100
Railcar 94041	28	730	<5	<5	<100
Railcar 34064	31	730	<5	<5	<100
Monthly Average			<5	<5	<100

Kentec Groundwater Data
Water-Level Elevations
July 25, 1995
(Feet Above Mean Sea Level)

Monitoring Well Number	Groundwater/ Surface Water Elevation
MW-1	25.70
MW-3	26.12
MW-4A	26.05
MW-4B	23.65
MW-6	24.67
MW-7A	24.98
MW-7B	23.83
MW-8	26.13
MW-9	25.70
MW-10A	25.95
MW-10B	22.78
MW-11A	25.97
MW-11B	23.26
MW-12	25.17
MW-14A	24.78
MW-14B	20.47
MW-15	23.03
MW-16	25.38
MW-18	26.03

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R-12003-K REV. 8-90

DU PONT
REG. U.S. PAT. & TM. OFF.
ESTABLISHED 1802

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
KINSTON PLANT
P.O. BOX 800
KINSTON, NORTH CAROLINA 28502-0800
PHONE (919) 522-6111

FIBERS DEPARTMENT

Kinston, North Carolina
June 21, 1995

Mr. Willie A. Hardison
Div. of Environmental Management
Groundwater Section
1424 Carolina Avenue
Washington, NC 27889

Subject: Permit No. WQ0005906
E. I. du Pont de Nemours & Co., Inc.
Kentec Site, SIC Code No. 7399
Groundwater Remediation System
Lenoir County

Dear Mr. Hardison:

Pursuant to the requirements of the subject permit, here are the data for the specified timeframes. If there are any questions, please give me a call on (919) 522-6263.

Sincerely,

Jerry Henderson/jkj

J. D. Henderson, Manager
N.C. Environmental Affairs

JDH/jkj
Attachments

CH2M HILL

MEMORANDUM

TO: Jerry Henderson/ Du Pont

FROM: Doug Dronfield/ CH2M HILL

DATE: June 13, 1995

SUBJECT: Kentec Quarterly Groundwater Data and Monthly Railcar Data

Enclosed are the quarterly groundwater monitoring data results (February through April, 1995), the railcar concentrations, and monthly railcar average concentrations for the same time period (February through April, 1995). The submittal of this data to the state complies with Section II.2. of the June 17, 1992 Groundwater Remediation Permit. The railcar data (effluent from the groundwater treatment plant) are well within the limits established by in the permit (Section I.27).

Kentec Quarterly Groundwater Data
April, 1995
All Concentrations are PPB

Well Number	Date	1,1-Dichloro-ethene	1,1-Dichloro-ethane	1,4-Dioxane
MW-1	Apr-95	8.2	< 7	330
MW-3	Apr-95	36	<7	520
MW-4A	Apr-95	7.1	<7	1300
MW-4B	Apr-95	< 7	< 7	< 150
MW-6	Apr-95	< 7	8.7	6700
MW-7A	Apr-95	<7	< 7	550
MW-7B	Apr-95	< 7	< 7	< 150
MW-8	Apr-95	< 7	<7	< 150
MW-9	Apr-95	< 7	< 7	< 150
MW-10A	Apr-95	< 7	<7	< 150
MW-10B	Apr-95	< 7	< 7	< 150
MW-11A	Apr-95	< 7	< 7	< 150
MW-11B	Apr-95	< 7	< 7	< 150
MW-12	Apr-95	< 7	< 7	< 150
MW-14A	Apr-95	< 7	<7	160
MW-14B	Apr-95	< 7	< 7	< 150
MW-15	Apr-95	< 7	<7	< 150
MW-16	Apr-95	< 7	< 7	< 150
MW-18	Apr-95	N\A	N\A	N\A
SW-11	Apr-95	< 7	< 7	< 150
SW-24	Apr-95	< 7	< 7	< 150
PS-2	Apr-95	14	54	< 150

Kentec Groundwater Treatment Facility
February - April, 1995
Railcar

Identification Code	Date	Time	DCE (ppb)	DCA (ppb)	1,4 Dioxane (ppb)
	February				
Railcar 94041	1	730	<5	<5	<100
Railcar 94041	6	730	<5	<5	<100
Railcar 34064	10	730	<5	<5	<100
Railcar 94041	13	730	<5	<5	<100
Railcar 34064	15	730	<5	<5	<100
Railcar 94041	17	730	<5	<5	<100
Railcar 34064	20	730	<5	<5	<100
Railcar 94041	22	730	<5	<5	<100
Railcar 34064	24	730	<5	<5	<100
Railcar 94041	27	730	<5	<5	<100
Monthly Average			<5	<5	<100
	March				
Railcar 34064	1	730	<5	<5	<100
Railcar 94041	3	730	<5	<5	<100
Railcar 34064	6	730	<5	<5	<100
Railcar 94041	8	730	<5	<5	<100
Railcar 34064	10	730	<5	<5	<100
Railcar 94041	13	730	<5	<5	<100
Railcar 34064	15	730	<5	<5	<100
Railcar 34064	24	730	<5	<5	<100
Railcar 94041	27	730	<5	<5	<100
Railcar 34064	29	730	<5	<5	<100
Railcar 94041	31	730	<5	<5	<100
Monthly Average			<5	<5	<100
	April				
Railcar 34064	3	730	<5	<5	<100
Railcar 94041	10	730	<5	<5	<100
Railcar 34064	12	730	<5	<5	<100
Railcar 94041	13	730	<5	<5	<100
Railcar 34064	18	730	<5	<5	<100
Railcar 94041	19	730	<5	<5	<100
Railcar 34064	21	730	<5	<5	<100
Railcar 34064	26	730	6	<5	<100
Railcar 94041	28	730	<5	<5	<100
Monthly Average			5.08	<5	<100

Kentec Groundwater Data
Water-Level Elevations
April 18, 1995
(Feet Above Mean Sea Level)

Monitoring Well Number	Groundwater/ Surface Water Elevation
MW-1	25.67
MW-3	25.77
MW-4A	25.88
MW-4B	23.38
MW-6	24.04
MW-7A	23.53
MW-7B	24.88
MW-8	25.53
MW-9	25.86
MW-10A	25.70
MW-10B	22.78
MW-11A	25.42
MW-11B	23.21
MW-12	24.76
MW-14A	21.70
MW-14B	23.58
MW-15	22.39
MW-16	24.90
MW-18	25.68
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R-12003-K REV. 8-90

DU PONT
REG. U.S. PAT. & TM. OFF.
ESTABLISHED 1802

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
KINSTON PLANT
P.O. BOX 800
KINSTON, NORTH CAROLINA 28502-0800
PHONE (919) 522-6111
FIBERS DEPARTMENT

Kinston, North Carolina
February 27, 1995

Mr. Willie A. Hardison
Div. of Environmental Management
Groundwater Section
1424 Carolina Avenue
Washington, NC 27889

Subject: Permit No. WQ0005906
E. I. du Pont de Nemours & Co., Inc.
Kentec Site, SIC Code No. 7399
Groundwater Remediation System
Lenoir County

Dear Mr. Hardison:

Pursuant to the requirements of the subject permit, here are the data for the specified timeframes. If there are any questions, please give me a call on (919) 522-6263.

Sincerely,

J. D. Henderson, Manager
N.C. Environmental Affairs

JDH/jkj
Attachments

CH2M HILL

MEMORANDUM

TO: Jerry Henderson/ Du Pont

FROM: Doug Dronfield/ CH2M HILL

DATE: February 21, 1995

SUBJECT: Kentec Quarterly Groundwater Data and Monthly Railcar Data

Enclosed are the quarterly groundwater monitoring data results (November, 1994 through January, 1995), the railcar concentrations, and monthly railcar average concentrations for the same time period (November, 1994 through January, 1995). The submittal of this data to the state complies with Section II.2. of the June 17, 1992 Groundwater Remediation Permit.

The railcar data (effluent from the groundwater treatment plant) are well within the limits established by in the permit (Section I.27).

Kentec Quarterly Groundwater Data
January, 1995
All Concentrations are PPB

Well Number	Date	1,1-Dichloro-ethene	1,1-Dichloro-ethane	1,4-Dioxane
MW-1	Oct-94	< 7	< 7	< 150
MW-3	Oct-94	31	18	480
MW-4A	Oct-94	7.6	<7	720
MW-4B	Oct-94	< 7	< 7	< 150
MW-6	Oct-94	< 7	< 7	6700
MW-7A	Oct-94	<7	< 7	220
MW-7B	Oct-94	< 7	< 7	< 150
MW-8	Oct-94	< 7	<7	< 150
MW-9	Oct-94	< 7	< 7	< 150
MW-10A	Oct-94	< 7	<7	< 150
MW-10B	Oct-94	< 7	< 7	< 150
MW-11A	Oct-94	< 7	< 7	< 150
MW-11B	Oct-94	< 7	< 7	< 150
MW-12	Oct-94	< 7	< 7	< 150
MW-14A	Oct-94	< 7	<7	220
MW-14B	Oct-94	< 7	< 7	< 150
MW-15	Oct-94	< 7	<7	< 150
MW-16	Oct-94	< 7	< 7	< 150
MW-18	Oct-94	N\A	N\A	N\A
SW-11	Oct-94	< 7	< 7	< 150
SW-24	Oct-94	< 7	< 7	< 150
PS-2	Oct-94	20	64	< 150

MW 18 was dry during this sampling event.

Kentec Groundwater Treatment Facility
November, 1994 - January, 1995
Railcar

Identification Code	Date	Time	DCE (ppb)	DCA (ppb)	1,4 Dioxane (ppb)
	November				
Railcar 94041	2	730	5	<5	<100
Railcar 34064	4	730	<5	<5	<100
Railcar 94041	7	730	<5	<5	<100
Railcar 34064	9	730	<5	<5	<100
Railcar 94041	11	730	<5	<5	<100
Railcar 34064	14	730	<5	<5	<100
Railcar 94041	16	730	<5	<5	<100
Railcar 94041	21	730	<5	<5	<100
Railcar 34064	23	730	<5	<5	<100
Railcar 94041	28	730	<5	<5	<100
Railcar 34064	30	730	<5	<5	<100
Monthly Average			5	<5	<100
	December				
Railcar 94041	2	730	<5	<5	<100
Railcar 34064	5	730	<5	<5	<100
Railcar 34064	9	730	<5	<5	<100
Railcar 94041	12	730	<5	<5	<100
Railcar 34064	14	730	<5	<5	<100
Railcar 94041	16	730	<5	<5	<100
Railcar 34064	19	730	<5	<5	<100
Railcar 94041	21	730	<5	<5	<100
Railcar 94041	27	730	<5	<5	<100
Railcar 34064	28	730	<5	<5	<100
Railcar 94041	30	730	<5	<5	<100
Monthly Average			<5	<5	<100
	January				
Railcar 34064	3	730	<5	<5	<100
Railcar 94041	4	730	<5	<5	<100
Railcar 94041	9	730	<5	<5	<100
Railcar 34064	11	730	<5	<5	<100
Railcar 94041	13	730	<5	<5	<100
Railcar 34064	16	730	<5	<5	<100
Railcar 94041	18	730	<5	<5	<100
Railcar 34064	20	730	<5	<5	<100
Railcar 94041	23	730	<5	<5	<100
Railcar 34064	25	730	<5	<5	<100
Railcar 94041	27	730	<5	<5	<100
Railcar 34064	30	730	<5	<5	<100
Monthly Average			<5	<5	<100

Kentec Groundwater Data
Water-Level Elevations
January 24, 1995
(Feet Above Mean Sea Level)

Monitoring Well Number	Groundwater/ Surface Water Elevation
MW-1	25.34
MW-3	25.04
MW-4A	25.16
MW-4B	22.73
MW-6	23.67
MW-7A	24.68
MW-7B	22.95
MW-8	25.28
MW-9	25.48
MW-10A	25.07
MW-10B	21.71
MW-11A	24.64
MW-11B	22.33
MW-12	25.65
MW-14A	22.28
MW-14B	22.70
MW-15	23.51
MW-16	22.70
MW-18	24.18
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R-12003-K REV. 8-90

DUPONT
REG US PAT & TM OFF
ESTABLISHED 1802

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
KINSTON PLANT
P.O. BOX 800
KINSTON, NORTH CAROLINA 28502-0800
PHONE (919) 522-6111

FIBERS DEPARTMENT

Kinston, North Carolina
December 5, 1994

Mr. Willie A. Hardison
Div. of Environmental Management
Groundwater Section
1424 Carolina Avenue
Washington, NC 27889

Subject: Permit No. WQ0005906
E. I. du Pont de Nemours & Co., Inc.
Kentec Site, SIC Code No. 7399
Groundwater Remediation System
Lenoir County

Dear Mr. Hardison:

Pursuant to the requirements of the subject permit, here are the data for the specified timeframes. If there are any questions, please give me a call on (919) 522-6263.

Sincerely,

J. D. Henderson/jkj

J. D. Henderson, Manager
N.C. Environmental Affairs

JDH/jkj
Attachments

MEMORANDUM

CH2M HILL

TO: Jerry Henderson/ Du Pont

FROM: Doug Dronfield/ CH2M HILL

DATE: November 22, 1994

SUBJECT: Kentec Quarterly Groundwater Data and Monthly Railcar Data

Enclosed are the quarterly groundwater monitoring data results (August through October, 1994), the railcar concentrations, and monthly railcar average concentrations for the same time period (August through October, 1994). The submittal of this data to the state complies with Section II.2. of the June 17, 1992 Groundwater Remediation Permit. The railcar data (effluent from the groundwater treatment plant) are well within the limits established by in the permit (Section I.27).

Kentec Quarterly Groundwater Data
October, 1994
All Concentrations are PPB

Well Number	Date	1,1-Dichloro-ethene	1,1-Dichloro-ethane	1,4-Dioxane
MW-1	Oct-94	12	< 7	238
MW-3	Oct-94	33	11	508
MW-4A	Oct-94	11	<7	1207
MW-4B	Oct-94	< 7	< 7	< 150
MW-6	Oct-94	< 7	< 7	6690
MW-7A	Oct-94	<7	< 7	576
MW-7B	Oct-94	< 7	< 7	< 150
MW-8	Oct-94	< 7	<7	< 150
MW-9	Oct-94	< 7	< 7	< 150
MW-10A	Oct-94	< 7	<7	< 150
MW-10B	Oct-94	< 7	< 7	< 150
MW-11A	Oct-94	< 7	< 7	< 150
MW-11B	Oct-94	< 7	< 7	< 150
MW-12	Oct-94	< 7	< 7	< 150
MW-14A	Oct-94	< 7	<7	406
MW-14B	Oct-94	< 7	< 7	< 150
MW-15	Oct-94	< 7	<7	191
MW-16	Oct-94	< 7	< 7	< 150
MW-18	Oct-94	N\A	N\A	N\A
SW-11	Oct-94	< 7	< 7	< 150
SW-24	Oct-94	< 7	< 7	< 150
PS-2	Oct-94	<7	72	193

Note: MW-18 was dry during the sampling event.

Kentec Groundwater Treatment Facility
August - October, 1994
Railcar

Identification Code	Date	Time	DCE (ppb)	DCA (ppb)	1,4 Dioxane (ppb)
	August				
Railcar 94041	17	730	<5	<5	<100
Railcar 34064	19	800	8	<5	<100
Railcar 94041	22	800	<5	<5	<100
Railcar 34064	24	800	<5	<5	<100
Railcar 94041	26	800	<5	<5	<100
Railcar 34064	29	800	<5	<5	<100
Railcar 94041	31	800	<5	<5	<100
Monthly Average			5.4	<5	<100
	September				
Railcar 94041	6	730	<5	<5	<100
Railcar 34064	8	730	5	<5	<100
Railcar 94041	12	800	<5	<5	<100
Railcar 34064	14	800	<5	<5	<100
Railcar 94041	16	800	7	<5	<100
Railcar 34064	19	800	<5	<5	<100
Railcar 94041	21	800	<5	<5	<100
Railcar 34064	23	730	<5	<5	<100
Railcar 94041	26	730	6	6	<100
Railcar 34064	28	800	<5	<5	<100
Railcar 94041	30	800	<5	<5	<100
Monthly Average			5.3	5.1	<100
	October				
Railcar 94041	3	730	<5	<5	<100
Railcar 34064	5	800	7	<5	<100
Railcar 34064	7	800	<5	<5	<100
Railcar 94041	10	800	<5	<5	<100
Railcar 34064	15	800	<5	<5	<100
Railcar 34064	26	700	<5	<5	<100
Railcar 94041	28	730	<5	<5	<100
Railcar 94041	31	730	<5	<5	<100
Monthly Average			5.3	<5	<100

Kentec Groundwater Data
Water-Level Elevations
October 4, 1994
(Feet Above Mean Sea Level)

Monitoring Well Number	Groundwater/ Surface Water Elevation
MW-1	23.95
MW-3	24.17
MW-4A	24.10
MW-4B	21.33
MW-6	23.28
MW-7A	23.63
MW-7B	21.58
MW-8	23.80
MW-9	23.71
MW-10A	23.83
MW-10B	20.58
MW-11A	23.70
MW-11B	20.94
MW-12	24.85
MW-14A	21.63
MW-14B	21.18
MW-15	21.86
MW-16	23.60
MW-18	23.76

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R-12003-K REV. 8-90

DUPONT
REG US PAT & TM OFF
ESTABLISHED 1802

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
KINSTON PLANT
P.O. BOX 800
KINSTON, NORTH CAROLINA 28502-0800
PHONE (919) 522-6111
FIBERS DEPARTMENT

September 19, 1994

Mr. Willie A. Hardison
Div. of Environmental Management
Groundwater Section
P. O. Box 1507
Washington, NC 27889

Subject: Permit No. WQ0005906
E. I. du Pont de Nemours & Co., Inc.
Kentec Site, SIC Code No. 7399
Groundwater Remediation System
Lenoir County

Dear Mr. Hardison:

Pursuant to the requirements of the subject permit, here are the data for the specified timeframes. If there are any questions, please give me a call on (919) 522-6263.

Sincerely,

J. Henderson /jkj

J. D. Henderson, Manager
N.C. Environmental Affairs

JDH/jkj
Attachments

MEMORANDUM CH2M HILL

TO: Jerry Henderson/ Du Pont

FROM: Doug Dronfield/ CH2M HILL

DATE: September 7, 1994

SUBJECT: Kentec Quarterly Groundwater Data and Monthly Railcar Data

Enclosed are the quarterly groundwater monitoring data results (May, 1994 through July, 1994), the railcar concentrations, and monthly railcar average concentrations for the same time period (May, 1994 through July, 1994). The submittal of this data to the state complies with Section II.2. of the June 17, 1992 Groundwater Remediation Permit.

The railcar data (effluent from the groundwater treatment plant) are well within the limits established by in the permit (Section I.27).

Kentec Quarterly Groundwater Data
July, 1994
All Concentrations are PPB

Well Number	Date	1,1-Dichloro-ethene	1,1-Dichloro-ethane	1,4-Dioxane
MW-1	Jul-94	24	< 7	350
MW-3	Jul-94	94	91	520
MW-4A	Jul-94	21	24	1200
MW-4B	Jul-94	< 7	< 7	< 150
MW-6	Jul-94	< 7	< 7	8100
MW-7A	Jul-94	13	< 7	470
MW-7B	Jul-94	< 7	< 7	< 150
MW-8	Jul-94	< 7	7.6	< 150
MW-9	Jul-94	< 7	< 7	< 150
MW-10A	Jul-94	< 7	25	< 150
MW-10B	Jul-94	< 7	< 7	< 150
MW-11A	Jul-94	< 7	< 7	< 150
MW-11B	Jul-94	< 7	< 7	< 150
MW-12	Jul-94	< 7	< 7	< 150
MW-14A	Jul-94	< 7	15	900
MW-14B	Jul-94	< 7	< 7	< 150
MW-15	Jul-94	< 7	20	< 150
MW-16	Jul-94	< 7	< 7	< 150
MW-18	Jul-94	< 7	< 7	< 150
SW-11	Jul-94	< 7	< 7	< 150
SW-24	Jul-94	< 7	< 7	< 150
PS-2	Jul-94	49	240	760

Kentec Groundwater Treatment Facility
May - July, 1994
Railcar

Identification Code	Date	Time	DCE (ppb)	DCA (ppb)	1,4 Dioxane (ppb)
	May				
Railcar 34064	2	800	5	11	<100
Railcar 94041	4	800	<5	8	<100
Railcar 34064	6	800	8	8	<100
Railcar 94041	9	800	6	5	<100
Railcar 34064	12	800	<5	9	<100
Railcar 94041	13	730	<5	7	<100
Railcar 34064	16	800	<5	<5	<100
Railcar 94041	19	800	<5	5	<100
Railcar 34064	23	800	<5	<5	<100
Railcar 94041	27	800	<5	9	<100
Railcar 34064	31	800	<5	<5	<100
Monthly Average			5.4	7	<100
	June				
Railcar 94041	1	800	<5	<5	<100
Railcar 34064	3	800	<5	<5	<100
Railcar 94041	6	800	7	<5	<100
Railcar 34064	8	800	<5	<5	<100
Railcar 94041	10	800	<5	<5	<100
Railcar 34064	13	800	<5	<5	<100
Railcar 94041	N/A				
Railcar 34064	17	730	<5	<5	<100
Railcar 94041	24	800	<5	<5	<100
Railcar 34064	27	800	<5	5	<100
Monthly Average			5.2	5	<100
	July				
Railcar 94041	1	730	<5	7	<100
Railcar 34064	5	800	<5	<5	<100
Railcar 94041	7	730	<5	<5	<100
Railcar 34064	11	800	<5	<5	<100
Railcar 94041	13	730	<5	<5	<100
Railcar 34064	15	800	<5	<5	<100

Kentec Groundwater Data
Water-Level Elevations
July 5, 1994
(Feet Above Mean Sea Level)

Monitoring Well Number	Groundwater/ Surface Water Elevation
MW-1	23.92
MW-3	23.17
MW-4A	23.09
MW-4B	22.73
MW-6	23.19
MW-7A	24.33
MW-7B	22.73
MW-8	23.68
MW-9	25.18
MW-10A	24.90
MW-10B	21.78
MW-11A	25.27
MW-11B	22.11
MW-12	23.88
MW-14A	20.70
MW-14B	21.43
MW-15	21.26
MW-16	22.13
MW-18	23.83

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WARO

State of North Carolina
Department of Environment,
Health and Natural Resources
Washington Regional Office

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
Nancy W. Smith, Regional Manager

DEHNR

DIVISION OF ENVIRONMENTAL MANAGEMENT
7 June 1994

Mr. Marvin Blount, Jr.
400 W. First Street
Greenville, North Carolina 27834

Dear Mr. Blount:

As promised during our 1 June 1994 conference, please find enclosed the chronology from Division files on the James/Kentec/DuPont site. I have thought about meeting the management team from James Enterprises with Mr. Ernie Long of DuPont, and I can't remember where it took place. It could have even been a chance encounter in Raleigh in the Division's headquarters building.

If further information or clarification is required, please advise.

Sincerely,

Ann Tyndall

for Jim Mulligan
Regional Supervisor
Washington Regional Office

JM/aht

1424 Carolina Avenue, Washington, North Carolina 27889 Telephone 919-946-6481 FAX 919-975-3716

Incident Name: DUPONT KENTEC Region/County: WARD LENOIR

Groundwater Incident File # _____ Ranking Performed by: W.R. CREW

Date: 8/11/94

NORTH CAROLINA
GROUNDWATER CONTAMINATION INCIDENT MANAGEMENT
SITE PRIORITY RANKING SYSTEM

(To be completed by Regional Office)

		Points Awarded
I.	**IMMINENT HAZARD ASSESSMENT**	
A.	Explosion - free product in confined areas or vapor phase product detected at or above 20% of the lower explosive limit or at health concern levels; award 50 points total	0
B.	Fire - free product subject to ignition in exposed areas such as surface water impoundments, streams, excavations, etc.; award 50 points total	0
II.	**EXPOSURE ASSESSMENT**	
A.	Contaminated Drinking Water Supplies	
1.	Private, domestic water supply well containing substances in concentrations exceeding 15A NCAC 2L groundwater quality standards; award 10 points per well	0
2.	Public or institutional water supply well containing substances in concentrations exceeding 15A NCAC 2L groundwater quality standards; award 20 points per well	0
3.	Exceedances of Class WS-1 surface water quality standards as a result of groundwater discharge; award 20 points per surface water body impacted	0
4.	If a water supply well identified in items II. A. 1 and II. A. 2 cannot be replaced by an existing public water supply source requiring hook-up only; award additional 10 points per irreplaceable well	0
B.	Threat to Uncontaminated Drinking Water Supplies	
1.	Private, domestic water supply well located within 1500 feet down gradient of contaminant source; award 10 points per well	30
2.	Public or institutional water supply well located within 1500 feet downgradient of contaminant source; award 15 points per well	0
3.	Raw surface water intake for public water supply located within 1/2 mile downgradient of contaminant source; award 5 points per water supply system	0
4.	If any well identified in items II. B. 1 and II. B. 2 or an intake in item II. B. 3. are located within 250 feet of contaminant source; award additional 20 points total (not per well or intake)	20
C.	Vapor Phase Exposure	
1.	Product vapors detected in inhabitable building(s) below 20% of the lower explosive limit or health concern levels; award 30 points total	0

Points Awarded

2. Product vapors detected in other confined areas (uninhabitable buildings, sewer lines, utility vaults, etc.) below 20% of the lower explosive limit; award 10 points total — 0

III. SOURCE ASSESSMENT

A. Uncontrolled or Unabated Primary Source (including dumpsites, stockpiles, lagoons, land applications, septic tanks, landfills, underground and above ground storage tanks, etc.)

1. Suspected or confirmed source remains in active use and continues to receive raw product, wastewater or solid waste; award 30 points per source — 0

2. Active use of suspected or confirmed source has been discontinued or source was caused by a one-time release of product or waste, however, source continues to release product or contaminants into the environment; award 10 points per source — 10

IV. ENVIRONMENTAL VULNERABILITY ASSESSMENT

A. Vertical Contaminant Migration - Literature or well logs indicate that no confining layer is present above bedrock or within twenty feet of land surface; award 10 points total — 0

B. Horizontal Contaminant Migration - Data or observations indicate that no discharge points or aquifer discontinuities exist between the source and the nearest downgradient drinking water supply; award 10 points total — 0

C. Existing Groundwater Quality - The worst case monitor or supply well contains contaminant levels:

1. At less than 10 times the 2L groundwater standards; award 5 points — 0

2. Between 10 and 100 times the 2L groundwater standards; award 20 points — 20

3. Greater than 100 times the 2L groundwater standards; award 40 points — 0

V. REGIONAL OFFICE RESPONSE (LETTER RANK)

Priority A - (Site meets any one of the criteria)

1. Water supply well(s) contaminated and no alternate water supplies available.

2. Vapors present in confined areas at explosive or health concern levels.

3. Treated surface water supply in violation of the safe drinking standards.

Priority B - (Any One)

1. Water supply well(s) contaminated, but alternate water supplies available.

2. Water supply well(s) within 1500 feet of site, but not contaminated and no alternate water supplies available.

3. Vapors present in confined areas but not at explosive or health concern levels.

Priority C - (Both)

1. No water supply well(s) contaminted.

2. Water supply well(s) greater than 1500 feet from site, no alternate water supply available.

Priority D - (Both)

1. No water supply well(s) contaminted.

2. Water supply well(s) within 1500 feet of site but alternate water supplies available.

Priority E - (Both)

1. No water supply well(s) contaminated or within 1500 feet of site.

2. Area served by alternate water supply.

TOTAL POINTS AWARDED 80 / D

#/Letter

R-12003-K REV. 8-90

DUPONT
REG US PAT & TM OFF
ESTABLISHED 1802

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
KINSTON PLANT
P.O. BOX 800
KINSTON, NORTH CAROLINA 28502-0800
PHONE (919) 522-6111

FIBERS DEPARTMENT

May 27, 1994

Mr. Willie A. Hardison
Div. of Environmental Management
Groundwater Section
P. O. Box 1507
Washington, NC 27889

Subject: Permit No. WQ0005906
E. I. du Pont de Nemours & Co. Inc.
Kentec Site, SIC Code No. 7399
Groundwater Remediation System
Lenoir County

Dear Mr. Hardison:

Pursuant to the requirements of the subject permit, here are the data for the specified time frames. If there are any questions, please give me a call on (919) 522-6263.

Sincerely,

J. D. Henderson /jkj

J. D. Henderson, Manager
N.C. Environmental Affairs

JDH/jkj
Attachments

MEMORANDUM CH2M HILL

TO: Jerry Henderson/ Du Pont

FROM: Doug Dronfield/ CH2M HILL

DATE: May 19, 1994

SUBJECT: Kentec Quarterly Groundwater Data and Monthly Railcar Data

Enclosed are the quarterly groundwater monitoring data results (February through April, 1994), the railcar concentrations, and monthly railcar average concentrations for the same time period (February through March, 1994). The submittal of this data to the state complies with Section II.2. of the June 17, 1992 Groundwater Remediation Permit.

The railcar data (effluent from the groundwater treatment plant) are well within the limits established by in the permit (Section I.27).

Kentec Quarterly Groundwater Data
April, 1994
All Concentrations are PPB

Well Number	Date	1,1-Dichloro-ethene	1,1-Dichloro-ethane	1,4-Dioxane
MW-1	Apr-94	< 7	< 7	170
MW-3	Apr-94	20	8.7	280
MW-4A	Apr-94	< 7	< 7	1200
MW-4B	Apr-94	< 7	< 7	< 150
MW-6	Apr-94	< 7	< 7	7600
MW-7A	Apr-94	< 7	< 7	340
MW-7B	Apr-94	< 7	< 7	< 150
MW-8	Apr-94	< 7	< 7	220
MW-9	Apr-94	< 7	< 7	< 150
MW-10A	Apr-94	< 7	< 7	< 150
MW-10B	Apr-94	< 7	< 7	< 150
MW-11A	Apr-94	< 7	< 7	< 150
WM-11B	Apr-94	< 7	< 7	< 150
MW-12	Apr-94	< 7	< 7	< 150
MW-14A	Apr-94	< 7	< 7	240
MW-14B	Apr-94	< 7	< 7	< 150
MW-15	Apr-94	< 7	28	< 150
MW-16	Apr-94	< 7	< 7	< 150
MW-18	Apr-94	< 7	< 7	< 150
SW-11	Apr-94	< 7	< 7	< 150
SW-24	Apr-94	< 7	< 7	180
PS-2	Apr-94	< 7	13	< 150

Kentec Groundwater Treatment Facility
February-April,1994
Railcar

Identification Code	Date	Time	DCE (ppb)	DCA (ppb)	1,4 Dioxane (ppb)
	February				
Railcar 94041	2	800	<5	<5	<100
Railcar 34064	4	700	7	<5	<100
Railcar 94041	7	700	<5	<5	<100
Railcar 34064	9	700	<5	<5	<100
Railcar 94041	11	700	<5	<5	<100
Railcar 34064	14	700	<5	7	189
Railcar 94041	17	800	<5	<5	<100
Railcar 34064	21	700	<5	<5	<100
Railcar 94041	22	800	<5	<5	<100
Railcar 34064	23	730	<5	5	<100
Railcar 94041	25	700	<5	6	<100
Railcar 34064	28	700	<5	9	<100
Monthly Average			5.1	6.3	107.4
	March				
Railcar 94041	1	800	<5	<5	<100
Railcar 34064	3	700	<5	<5	<100
Railcar 94041	4	700	<5	<5	<100
Railcar 34064	7	730	<5	<5	<100
Railcar 94041	9	800	<5	<5	<100
Railcar 34064	10	800	<5	9	<100
Railcar 94041	14	800	<5	<5	<100
Railcar 34064	15	800	<5	<5	<100
Railcar 94041	17	800	<5	<5	<100
Railcar 34064	22	800	<5	<5	<100
Railcar 94041	22	800	<5	<5	<100
Railcar 34064	24	800	5	9	<100
Railcar 94041	28	800	<5	5	<100
Railcar 34064	29	700	<5	<5	<100
Railcar 94041	31	730	<5	<5	<100
Monthly Average			5	5.5	<100
	April				
Railcar 34064	5	730	<5	12	<100
Railcar 94041	6	800	<5	6	<100
Railcar 34064	8	730	<5	<5	<100
Railcar 94041	11	800	<5	<5	<100
Railcar 34064	13	800	6	5	<100
Railcar 94041	15	800	<5	<5	<100
Railcar 34064	18	800	<5	5	<100
Railcar 94041	20	800	<5	6	<100
Railcar 34064	22	800	<5	<5	<100
Railcar 94041	25	800	<5	<5	<100
Railcar 34064	27	800	<5	<5	<100
Railcar 94041	29	800	<5	10	<100
Monthly Average			5.1	6.1	<100

Kentec Groundwater Data
Water-Level Elevations
April 12, 1994
(Feet Above Mean Sea Level)

Monitoring Well Number	Groundwater/ Surface Water Elevation
MW-1	25.97
MW-3	24.27
MW-4A	26.17
MW-4B	23.43
MW-6	24.36
MW-7A	24.75
MW-7B	24.58
MW-8	25.87
MW-9	26.13
MW-10A	26.02
MW-10B	23.61
MW-11A	25.82
MW-11B	24.01
MW-12	25.08
MW-14A	21.83
MW-14B	24.38
MW-15	22.88
MW-16	25.00
MW-18	26.01

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DIVISION OF ENVIRONMENTAL MANAGEMENT
GROUNDWATER SECTION

May 10, 1994

TO: Jim Mulligan - WaRO Regional Supervisor

THROUGH: Willie Hardison - WaRO Groundwater Supervisor

FROM: Guy Pearce - Hydrogeologist

SUBJECT: Establishment of Acceptable Groundwater Clean Up Levels for Substances With a Standard Below Detection Limits or, Substances With No Specified Standard.

This memo is in response to our conversation on Friday, May 6, 1994, concerning the corrective action requirements of NCAC 2L and the determination of acceptable clean up levels for substances which have either; 1) a standard below the limit of detection, or; 2) no established standard. It should be noted that the NCAC 15A 2L Regulations were revised on November 8, 1993. The revisions included an expansion of the **2L .0106 - CORRECTIVE ACTION** requirements to allow limited remediation (not to the standards), and remediation based on natural biodegradation and attenuation. I have based this memo on the old regulations since they were in effect at the time corrective action was initiated at the DuPont-Kentec Site. A copy of the pertinent regulations are attached for your convenience.

NCAC 15A 2L .0202(c) stipulates that substances which are not naturally occurring, and for which no standard has been established, shall not be permitted in detectable concentrations in Class GA or GSA groundwater. For groundwater incidents that fall into this category, the responsible party has three (3) options (other than clean up to below detection limits) for establishing an acceptable clean up level. They are as follows:

1. **NCAC 15A 2L .0202(c)** allows any person to petition the Director to establish an interim maximum allowable concentration for unspecified substances based on systemic threshold concentration, a 1×10^{-6} incremental lifetime cancer risk, available toxicological information, etc.

2. **NCAC 15A 2L .0106(e)** states that the Director can authorize discontinuance of remedial action to restore groundwater to the level of the standard upon a

migration is not the central issue. JRM 5/11/94

demonstration by the responsible party that continued remediation would not result in a significant reduction in contaminant migration. concentration 2L .0106(f) states that once the Director has authorized discontinuance of a remedial action system, the responsible party is required to petition for a variance or a reclassification of the impacted groundwater. This option is applicable to both substances with a specified standard and substances without a specified standard.

3. **NCAC 15A 2L .0112** - ANALYTICAL PROCEDURES, outlines the appropriate methods or procedures to use for substances where the selected method or procedure provides a method detection limit at or less than the standard. None of the methods listed under **2L .0112(1)(a-d)** contained analytical methods for 1,4 Dioxane and DuPont was unable to find a method capable of detecting 1,4 Dioxane below the standard of 7 ppb. Based on discussions with DEM, including Mr. Ray Kelling (Chemistry Branch Supervisor at the DEM Lab in Cary), it was agreed to use EPA Method 8015 with a listed practical detection limit of 150 ppb for 1,4 Dioxane. **2L.0112(2)** requires the use of a method or procedure approved by the Director for substances where the standard is less than the limit of detectability. Although the Director (George Everette) signed a Pump and Haul Permit which stipulated that the target clean up levels for impacted groundwater at this site would be 150 ppb for 1,4 Dioxane, and 7 ppb for both DCE and DCA, there does not appear to be a letter granting formal approval of the analytical method used (EPA Method 8015) for detection of 1,4 Dioxane. This may have been an oversight on both DEM's and DuPont's part.

   With regard to the other two contaminants of concern at this site, 1,1 Dichloroethylene (DCE) had (and still has) a standard of 7 ppb. Since there are methods capable of detecting DCE at or less than the standard, 7 ppb is the target clean up level for this substance.

   1,1 Dichloroethane (DCA) did not have a specified standard at the time the corrective action plan was approved. DEM agreed to use 7 ppb as the target clean up level for this compound. The current 2L Regulations specify 700 ppb as the maximum allowable concentration for DCA.

If you have any questions, or wish to discuss this matter further, please contact me at any time.

.0105 ADOPTION BY REFERENCE

History Note: Statutory Authority G.S. 143-214.1;
Eff. December 30, 1983;
Repealed Eff. August 1, 1989.

.0106 CORRECTIVE ACTION

(a) The goal of actions taken to restore groundwater quality shall be restoration to the level of the standards, or as close thereto as is economically and technologically feasible.

(b) Any person conducting or controlling an activity which results in the discharge of a waste or hazardous substance or oil to the groundwaters of the state, or in proximity thereto, shall take immediate action to terminate and control the discharge, mitigate any hazards resulting from exposure to the pollutants and notify the Department of the discharge.

(c) Any person conducting or controlling an activity which results in an increase in the concentration of a substance in excess of the groundwater standard:

(1) as the result of activities, other than agricultural operations, not permitted by the state, shall assess the cause, significance and extent of the violation; submit a plan for eliminating the source of contamination and for restoration of groundwater quality; and implement the plan in accordance with a Special Order by Consent or a Special Order of the Commission.

(2) as a result of activities conducted under the authority of a permit issued by the state, shall, where such concentrations are detected:

(A) at or beyond a review boundary, demonstrate, through predictive calculations or modeling, that natural site conditions, facility design and operational controls will prevent a violation of standards at the compliance boundary; or submit a plan for alteration of existing site conditions, facility design or operational controls that will prevent a violation at the compliance boundary, and implement that plan upon its approval by the Director.

(B) at or beyond a compliance boundary, shall, assess the cause, significance and extent of the violation of groundwater quality standards and submit the results of the investigation and a plan for groundwater quality restoration to the Director. Upon approval by the Director, the permittee shall implement the plan in accordance with a Special Order by Consent or a Special Order of the Commission.

(d) In the evaluation of remedial action plans, the Director shall consider the extent of any violations, the extent of any threat to human health or safety, the extent of damage to the environment, technology available to accomplish restoration and the public and economic benefits to be derived from groundwater quality restoration.

(e) The Director may authorize the discontinuance of remedial action to restore groundwater quality to the level of the standard upon a demonstration by the responsible party to the Director that continuance would not result in significant reduction in the concentration of contaminants. In the consideration of a request to discontinue remedial actions, the Director shall consider the duration and degree of success of remedial efforts, the feasibility of other treatment techniques which could result in further reduction of contaminant levels, and the effect on groundwater users if contaminants remain at levels existing at the time of termination of remedial action.

(f) Upon a determination by the Director that continued remedial actions would result in no significant reduction in contaminant concentrations, the responsible party shall petition for a variance or a reclassification of the impacted groundwaters.

(g) Where groundwater quality standards are exceeded as a result of the application of pesticides or other agricultural chemicals, the Director shall request the Pesticide Board or the Department of Agriculture to assist the Division of Environmental Management in determining the cause of the violation. If the violation is determined to have resulted from the use of pesticides, the Director shall request the Pesticide Board to take appropriate regulatory action to control the use of the chemical or chemicals responsible for, or contributing to, such violations, or to discontinue their use.

History Note: Statutory Authority G.S. 143-215.2; 143-215.3(a)(1); 143B-282;
Eff. August 1, 1989.

.0107 COMPLIANCE BOUNDARY

(a) Any person subject to the provisions of G.S. 143-215.1 who causes, permits or has control over any discharge of waste, shall install a monitoring system, at such locations, and in such detail, as the Director may require to evaluate the effects of the discharge upon the waters of the state, including the effect of any actions taken to restore groundwater quality, as well as the efficiency of any treatment facility.

(b) Monitoring systems shall be operated in a manner that will not result in the contamination of adjacent groundwaters of a higher quality.

(c) Monitoring shall be conducted and results reported in a manner and at a frequency specified by the Director.

History Note: Statutory Authority G.S. 143-215.1(b); 143-215.3(a)(1); 143-215.65; 143-215.66; 143B-282; Eff. August 1, 1989.

.0111 REPORTS

Any person subject to the provisions of G.S. 143-215.1 and to the requirements for corrective action specified in Rule .0106 of this Subchapter shall submit to the Director, in such detail as the Director may require, a written report that describes:

(1) the results of the investigation specified in Paragraphs (c)(1) and (c)(2)(B) of Rule .0106, including but not limited to:
  (a) a description of the sampling procedures followed and methods of chemical analyses used; and
  (b) all technical data utilized in support of any conclusions drawn or determinations made.
(2) the results of the predictive calculations or modeling, including a copy of the calculations or model runs and all supporting technical data, used in the demonstration required in Paragraph (c)(2)(A) of Rule .0106; and
(3) the proposed methodology and timetable associated with the restoration of groundwater quality for those situations identified in Paragraphs (c)(1) and (c)(2)(B) of Rule .0106.

History Note: Statutory Authority G.S. 143-215.1(b); 143-215.3(a)(1); 143-215.65; 143B-282; Eff. August 1, 1989.

.0112 ANALYTICAL PROCEDURES

Tests or analytical procedures to determine compliance or noncompliance with the water quality standards established in Rule .0202 of this Subchapter will be in accordance with:

(1) The following methods or procedures for substances where the selected method or procedure provides a method detection limit value at or less than the standard:
  (a) Standard methods for the Examination of Water and Wastewater, 16th Edition, 1985, published jointly by American Public Health Association, American Water Works Association and Water Pollution Control Federation;
  (b) Methods for Chemical Analysis of Water and Waste, 1979, U.S. Environmental Protection Agency publication number EPA-600/4-79-020, as revised March 1983;
  (c) Test Methods for Evaluating Solid Wastes: Physical/Chemical Methods, 3rd Edition, 1986, U.S. Environmental Protection Agency publication number SW-846;
  (d) Test Procedures for the Analysis of Pollutants Under the Clean Water Act, Federal Register Vol. 49, No. 209, 40 CFR Part 136, October 26, 1984;
  (e) Methods or procedures approved by letter from the Director upon application by the regulated source.
(2) A method or procedure approved by the Director for substances where the standard is less than the limit of detectibility.

History Note: Statutory Authority G.S. 143-215.3(a)(1); 143B-282; Eff. August 1, 1989

.0113 VARIANCE

(a) The commission, on its own initiative or pursuant to a request under G.S. 143-215.3(e), may grant variances to water quality standards and the compliance boundary. Persons subject to the provisions of G.S. 130A-294 may apply for a variance under this Section.

SECTION .0200 - CLASSIFICATIONS AND WATER QUALITY STANDARDS

.0201 GROUNDWATER CLASSIFICATIONS

The classifications which may be assigned to the groundwaters will be those specified in the following series of classifications:

(1) Class GA waters: usage and occurrence:
 (a) Best Usage. Existing or potential source of drinking water supply for humans.
 (b) Conditions Related to Best Usage. This class is intended for those groundwaters in which chloride concentrations are equal to or less than 250 mg/l, and which are considered suitable for drinking in their natural state, but which may require treatment to improve quality related to natural conditions.
 (c) Occurrence. In the saturated zone.
(2) Class GSA waters; usage and occurrence:
 (a) Best Usage. Existing or potential source of water supply for potable mineral water and conversion to fresh waters.
 (b) Conditions Related to Best Usage. This class is intended for those groundwaters in which the chloride concentrations due to natural conditions is in excess of 250 mg/l, but which otherwise may be considered suitable for use as potable water after treatment to reduce concentrations of naturally occurring substances.
 (c) Occurrence. In the saturated zone.
(3) Class GC waters: usage and occurrence:
 (a) Best Usage. Source of water supply for purposes other than drinking.
 (b) Conditions Related to Best Usage. This class includes those groundwaters that do not meet the quality criteria of waters having a higher classification and for which efforts to restore in-situ to a higher classification would not be technologically feasible, or not in the best interest of the public.
 (c) Occurrence. In the saturated zone, as determined by the commission on a case by case basis.

History Note: Statutory Authority G.S. 143-214.1; 143B-282(2);
Eff. June 10, 1979;
Amended Eff. August 1, 1989; September 1, 1984; December 30, 1983.

.0202 WATER QUALITY STANDARDS

(a) The water quality standards for the groundwaters of the state are those specified in this Rule. They are the maximum allowable concentrations resulting from any discharge of contaminants to the land or waters of the state, which may be tolerated without creating a threat to human health or which would otherwise render the groundwater unsuitable for its intended best usage. Where groundwater quality standards have been exceeded due to man's activities, restoration efforts shall be designed to restore groundwater quality to the level of the standard or as closely thereto as is practicable.

(b) The maximum allowable concentrations for contaminants specified in Paragraphs (g) and (h) of this Rule shall be as listed, except that:
 (1) Where the maximum allowable concentration of a substance is less than the limit of detectability, the substance shall not be permitted in detectable concentrations.
 (2) Where two or more substances exist in combination, the Director shall consider the effects of chemical interactions and may establish maximum concentrations at values less than those established in accordance with Paragraphs (c) and (g) of this Rule. In the absence of information to the contrary, the carcinogenic risks associated with carcinogens present shall be considered additive and the toxic effects associated with non-carcinogens present shall also be considered additive.
 (3) Where naturally occurring substances exceed the established standard, the standard will be the naturally occurring concentration as determined by the Director.

(c) Substances which are not naturally occurring and for which no standard is specified shall not be permitted in detectable concentrations in Class GA or Class GSA groundwaters. Any person may petition the Director to establish an interim maximum allowable concentration for an unspecified substance, however, the burden of demonstrating those concentrations of the substance which correspond to the levels described in Paragraph (d) of this Rule rests with the petitioner. The petitioner shall submit all toxicological and epidemiological data, study results, and calculations necessary to establish

a standard in accordance with the procedure prescribed in Paragraph (d) of this Rule. Within three months after the establishment of an interim maximum allowable concentration for a substance by the Director, the Director shall initiate action to consider adoption of a standard for that substance.

(d) Maximum allowable concentrations for substances in Class GA and Class GSA waters are established as the lesser of:

(1) Systemic threshold concentration calculated as follows: [Reference Dose (mg/kg/day) x 70 kg (adult body weight) x Relative Source Contribution (.10 for inorganics; .20 for organics)] / [2 liters/day (avg. water consumption)];
(2) Concentration which corresponds to an incremental lifetime cancer risk of $1x10^{-6}$;
(3) Taste threshold limit value;
(4) Odor threshold limit value;
(5) Maximum contaminant level; or
(6) National secondary drinking water standard.

(e) The following references, in order of preference, shall be used in establishing concentrations of substances which correspond to levels described in Paragraph (d) of this Rule.

(1) Integrated Risk Information System (U.S. EPA).
(2) Health Advisories (U.S. EPA Office of Drinking Water).
(3) Other health risk assessment data published by U.S. EPA.
(4) Other appropriate, published health risk assessment data.

(f) Water quality standards specified in Paragraphs (g) and (h) of this Rule and interim maximum allowable concentrations established pursuant to Paragraph (c) of this Rule shall be reviewed on a biennial basis. Appropriate modifications to established standards will be made in accordance with the procedure prescribed in Paragraph (d) of this Rule where modifications are considered appropriate based on data published subsequent to the previous review.

(g) Class GA Standards. Where not otherwise indicated, the standard refers to the total concentration in milligrams per liter of any constituent.

(1) acrylamide (propenamide): 0.00001
(2) arsenic: 0.05
(3) barium: 1.0
(4) benzene: 0.001
(5) bromoform (tribromomethane): 0.00019
(6) cadmium: 0.005
(7) carbofuran: 0.036
(8) carbon tetrachloride: 0.0003
(9) chlordane: 2.7×10^{-5}
(10) chloride: 250.0
(11) chlorobenzene: 0.3
(12) chloroform (trichloromethane): 0.00019
(13) 2-chlorophenol: 0.0001
(14) chromium: 0.05
(15) cis-1,2-dichloroethene: 0.07
(16) coliform organisms (total): 1 per 100 milliliters
(17) color: 15 color units
(18) copper: 1.0
(19) cyanide: 0.154
(20) 2, 4-D (2,4-dichlorophenoxy acetic acid): 0.07
(21) 1,2-dibromo-3-chloropropane: 2.5×10^{-5}
(22) dichlorodifluoromethane (Freon-12; Halon): 0.00019
(23) 1,2-dichloroethane (ethylene dichloride): 0.00038
(24) 1,1-dichloroethylene (vinylidene chloride): 0.007
(25) 1,2-dichloropropane: 0.00056
(26) p-dioxane (1,4-diethylene dioxide): 0.007
(27) dioxin: 2.2×10^{-10}
(28) dissolved solids (total): 500
(29) endrin: 0.0002
(30) epichlorohydrin (1-chloro-2,3-epoxypropane): 0.00354
(31) ethylbenzene: 0.029
(32) ethylene dibromide (EDB; 1,2-dibromoethane): 0.05×10^{-5}

TOX - 5.0 ug/l (ppb) = .005 mg/l (ppm)

TOC - 10 mg/l

Total Ammonia -

Total Dissolved Solids (TDS) - 500 mg/l (ppm)

Phenol

COD
Chemical Oxygen Demand

(33) ethylene glycol: 7.0
(34) flouride: 2.0
(35) foaming agents: 0.5
(36) gross alpha particle activity (including radium-226 but excluding radon and uranium): 15 pCi/l
(37) heptachlor: 7.6×10^{-5}
(38) heptachlor epoxide: 3.8×10^{-5}
(39) hexachlorobenzene (perchlorobenzene): 0.00002
(40) n-hexane: 14.3
(41) iron: 0.3
(42) lead: 0.05
(43) lindane: 2.65×10^{-5}
(44) manganese: 0.05
(45) mercury: 0.0011
(46) metadichlorobenzene (1,3-dichlorobenzene): 0.62
(47) methoxychlor: 0.1
(48) methylene chloride (dichloromethane): 0.005
(49) methyl ethyl ketone (MEK; 2-butanone): 0.17
(50) nickel: 0.15
(51) nitrate: (as N) 10.0 NO_3
(52) nitrite: (as N) 1.0 NO_2
(53) orthodichlorobenzene (1,2-dichlorobenzene): 0.62
(54) oxamyl: 0.175
(55) paradichlorobenzene (1,4-dichlorobenzene): 0.0018
(56) pentachlorophenol: 0.22
(57) pH: 6.5 - 8.5
(58) radium-226 and radium-228 (combined): 5 pCi/l
(59) selenium: 0.01
(60) silver: 0.05
(61) styrene (ethenylbenzene): 1.4×10^{-5}
(62) sulfate: 250.0
(63) tetrachloroethylene (perchloroethylene; PCE): 0.0007
(64) toluene (methylbenzene): 1.0
(65) toxaphene: 3.1×10^{-5}
(66) 2, 4, 5,-TP (Silvex): 0.01
(67) trans-1,2-dichloroethene: 0.07
(68) 1,1,1-trichloroethane (methyl chloroform): 0.2
(69) trichloroethylene (TCE): 0.0028
(70) vinyl chloride (chloroethylene): 1.5×10^{-5}
(71) xylenes (o-, m-, and p-): 0.4
(72) zinc: 5.0

(h) Class GSA Standards. The standards for this class shall be the same as those for Class GA except as follows:

(1) chloride: allowable increase not to exceed 100 percent of the natural quality concentration.
(2) total dissolved solids: 1000 mg/l.

(i) Class GC Waters.

(1) The concentrations of substances which, at the time of classification exceed water quality standards, shall not be permitted to increase. For all other substances, concentrations shall not be caused or permitted to exceed the established standard.
(2) The concentrations of substances which, at the time of classification, exceed water quality standards shall not cause or contribute to the contravention of groundwater or surface water quality standards in adjoining waters of a different class.
(3) Concentrations of specific substances, which exceed the established standard at the time of classification, shall be listed in Section .0300 of this Subchapter.

History Note: Statutory Authority G.S. 143-214.1; 143B-282(2);
Eff. June 10, 1979;
Amended Eff. August 1, 1989; September 1, 1984; December 30, 1983.

DIVISION OF ENVIRONMENTAL MANAGEMENT
GROUNDWATER SECTION

April 18, 1994

TO: Jim Mulligan - WaRO DEM Supervisor

THROUGH: Willie Hardison - WaRO Groundwater Supervisor

FROM: Guy Pearce - Hydrogeologist I

SUBJECT: DuPont - Kentec Site
Lenoir County
Groundwater Incident No. 6334

As you requested, I contacted Mr. Jerry Henderson of DuPont to arrange a date for a site visit. We have agreed to meet (onsite) at 9:30 A.M. on Monday, May 16, 1994. If you have any problems with this date please let me know as soon as possible so I can arrange an alternative date.

If you have any questions, or wish to discuss this matter further, please contact me at any time.

cc: WaRO GW Files

DUPONT

EXTERNAL AFFAIRS
150 Fayetteville Street Mall, Suite 2210
Raleigh, North Carolina 27601
Phone: (919) 834-8398
Fax: (919) 828-2707

April 15, 1994

Mr. Guy C. Pearce
North Carolina Department of
Environment, Health and Natural Resources
1424 Carolina Avenue
Post Office Box 2188
Washington, North Carolina 27889

RE: E. I. du Pont de Nemours - Kentec Site
Lenoir County
Incident No. 6334

Dear Mr. Pearce:

I wrote you on October 14, 1993 to advise you that the federal court overseeing the litigation brought by the Kentec neighbors had postponed DuPont's October 15, 1993 deadline for filing an affidavit of an expert witness setting forth the extent of any off-site contamination. (As you are aware, we had previously defined the horizontal groundwater plume at this site in every direction except along the southeastern boundary of the Kentec Facility premises.) On April 1, 1994, we filed with the court three affidavits addressing this issue. I enclose a copy of each.

These three affidavits, of Dr. Henry Harris, Douglas Dronfield, and Jay Vandeven, support the positions set forth in my October 14, 1993 letter. Specifically, these affidavits confirm that the groundwater plume does not reach as far to the southeast as Plaintiffs' monitoring wells MW-D, MW-F, and MW-H. (See Exhibit A, attached hereto.) As I advised you on October 14, we believe that no further groundwater characterization is necessary, since the horizontal extent of the plume has now been defined.

These affidavits note that certain compounds appear to be present in the surficial aquifer beneath the property of Bruce and Janice Grant -- the only neighboring property so affected. Predictably, these substances have been decreasing since the remediation system began operation. In fact, the most recent sampling shows that the DEM's three target compounds at the Kentec site, 1,4-dioxane, 1,1-dichloroethane (DCA), and 1,1-dichloroethene (DCE) were not detected above the 2L groundwater standards in any of the monitoring wells off the Kentec premises. (See Exhibit B) As shown in the data from my October 14, 1993 letter, chloroethane has been detected on the Grant property at trace

levels. This substance has likely appeared as a result of natural degradation of the target compounds. As you are aware, there is no specified 2L standard for chloroethane.

Our consultants have determined that the level of chemical substances observed in wells on the Grant property will continue to decrease. This conclusion is based on the interruption of the flow of the substances from their source, and on the processes of nature.

The interceptor trench between the Kentec Facility and the Grant property has apparently cut off, or at least substantially impeded, any flow of contaminants from the Facility to that property. Three factors support this observation. First, as mentioned above, the concentrations of DCE, DCA and 1,4-dioxane on the Grant property have been decreasing. Second, concentrations of all three of those substances have fallen below detectable levels in monitoring wells MW-10A and MW-11A on the Facility premises, along the interceptor trench at the Grant property line. Finally, water level data from the wells on both the Grant property and the Kentec site suggests that groundwater on the Grant property now flows towards the interceptor trench.

In addition to having been isolated from their source, the substances on the Grant property are diminishing through natural processes. Not only is natural degradation breaking the compounds into their constituents, but dilution of these substances by rainfall infiltrating to the surficial aquifer is further reducing their concentrations.

Please do not hesitate to give me a call if you have any questions regarding any of this information.

Sincerely,

Jerry D. Henderson, Manager
NC Environmental Affairs

Enclosures

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DUPONT-KENTEC SITE HISTORY

1969 - 1981

Kentec (owned by James Enterprises) operates as a parts cleaning facility under contract to DuPont. During this period, roughly 2000 GPD of rinsewater is discharged into the drainageway (ditch) located between facility and SR 1802. In late 1981, Kentec is purchased by DuPont.

1982

→ in GW files (to expire on 31, 1985)

Non-Discharge Permit No. 7210 issued to James Enterprises on March 3, 1982. Permits disposal of up to 2250 GPD of wastewater (rinsewater) via a septic tank and drainfield. Discharge of rinsewater into drainageway is ceased. This system remains in operation until 1986.

(A) check on rationale for discharge — suspect GW std + permit requirement

1986

→ by DuPont (voluntarily) (permit expired)

Subsurface disposal system is abandoned in February, from this point on, all wastewater is collected and shipped off-site for treatment/disposal. "Pump and Haul" Permit No. 12725 issued to DuPont on March 28, 1986.

1987

August 13, 1987 - CH2M Hill (consultants) for DuPont-Kentec submit to DEM a report titled GROUNDWATER ASSESSMENT AT KENTEC. The report is somewhat vague in that well construction details and specific analytical results are not provided.

September 18, 1987 - Based on our review, Rudy Smithwick sends a letter to Jerry Henderson of DuPont stating that additional information will be needed before the Groundwater Section can complete it's review.

October 29, 1987 - Letter to DuPont from Rudy Smithwick stating that violations of 2L standards had occurred. Letter also requests DuPont to conduct investigations to identify and remove any sources of groundwater contamination, and develop a remedial action plan. It should be noted that although the letter contains language similar to a notice of violation, it is not a NOV.

1988

January 12, 1988 - WaRO sends letter to DuPont summarizing a meeting held on January 5, 1988 concerning the need for additional investigation (site assessment). WaRO attempts to enter into a S.O.C. with DuPont but is apparently unsuccessful.

December 2, 1988 - WaRO receives report titled DuPont - Kentec Final Draft Groundwater Assessment - Phase 2. Assessment indicates presence of 1,4, Dioxane, 1,1, Dichloroethane (DCA), and 1,1, Dichloroethylene (DCE). The report makes the following recommendations:

1. Conduct soil sampling in drainfield area.
2. Installation of additional monitoring wells in the downgradient direction.
3. Installation of deeper monitoring wells to determine if impacts to the Pee Dee aquifer have occurred.
4. Additional surface water and sediment sampling to determine the presence and/or extent of contamination.
5. Sampling of nearby residential water supply wells.
6. Development of a topographic map of the site.

DuPont-Kentec purchases properties adjacent to the facility.

1989

Phase III assessment is initiated in October by CH2M Hill addressing the above noted recommendations.

1990

In July, an audit of wastewater sources is conducted to identify potential sources of groundwater contamination. The following areas of concern were noted:

1. Drainfield area
2. Wastewater settling tanks (underground)
3. Wet well serving as collection point for wastewater piping and all associated piping.
4. Former powdered metal disposal area.
5. Drainageways (ditches) that received wastewater.

1990 continued

6. Cleaning areas and aboveground storage tanks with containment structures (dikes).

Steps were taken to eliminate any potential continuing sources of contamination in late 1990 and early 1991.

November 26, 1990 - Results of Phase III investigation are submitted in a report titled "DuPont - Kentec GROUNDWATER INVESTIGATIONS"

1991

January 25, 1991 - Willie Hardison and Guy Pearce meet with DuPont-Kentec representatives at the Kentec facility to discuss appropriate course of action.

February 4, 1991 - A Notice of Violations is issued to ~~DuPont-Kentec~~ The NOV requires a site assessment report which indicates the horizontal and vertical extent of groundwater contamination to be submitted within sixty (60) days.

February 15, 1991 - Susan Broad of Environmental and Regulatory Consultants, Inc. reviews WaRO files concerning DuPont-Kentec.

March 18, 1991 - WaRO receives letter from Jerry Henderson of DuPont stating that horizontal extent of the contaminant plume cannot be completed within the sixty (60) day deadline established in the February 4, 1991 NOV due to offsite access problems.

April 9, 1991 - In accordance with the above-noted NOV, a report titled Kentec Groundwater Assessment is received by WaRO. The assessment recommends the following:

1. Installation of off-site monitor wells to determine the extent of contamination.
2. Installation of deep monitor well to determine if impacts to the Pee Dee aquifer have occurred.
3. Evaluation of all available data so that a feasibility study for groundwater remediation can be developed.

April 19, 1991 - a meeting is held with DuPont representatives at the Washington Regional Office to discuss the groundwater assessment report. The following concerns were voiced by DEM - Groundwater:

1. The lack of off-site assessment to determine

1991 (continued)

the horizontal extent of contamination.

not off-site issue!

2. The lack of sufficient data to determine the vertical extent of contamination.

did get data in July & Oct (w/ addendum scheduled on

DEM agrees to let DuPont: on-site separated from off-site due to access probs.

May 8, 1991 - Guy Pearce sends letter to DuPont-Kentec addressing the concerns expressed in the April 19 meeting. DEM also agrees to allow DuPont-Kentec to develop a remediation system to deal with on-site contamination. This agreement is prefaced on the conditions that additional off-site assessment will be conducted and that modifications to the corrective action plan/system may become necessary as more data becomes available.

did contain schedule

May 24, 1991 - Conceptual Remedial Action Plan (RAP) is submitted by DuPont-Kentec to deal with on-site contamination. The primary goals of the RAP are:

1. Prevent further contaminant migration.

2. Remove and treat contaminants to target clean-up levels.

3. Achieve a timely and cost effective clean-up.

June 6, 1991 - Letter from Guy Pearce (DEM-GW) approving the conceptual RAP for on-site contamination.

June 11, 1991 - Letter is received from DuPont-Kentec acknowledging receipt of DEM-GW RAP approval letter and requesting a meeting to discuss treatability study data and working drawings.

June 24, 1991 - Craig Bromby, an attorney for Moore & Van Allen requests access to DuPont-Kentec files. On July 2, Emily Mary Brown, of Moore & Van Allen reviews files.

June 26, 1991 - Meeting with DuPont-Kentec at WaRO to discuss RAP, treatability study data, and working drawings. Need for off-site assessment is also discussed.

July 8, 1991 - WaRO receives letter from DuPont-Kentec stating that access to off-site properties has been denied. A report titled KENTEC GROUNDWATER ASSESSMENT ONSITE PEEDEE AQUIFER ADDENDUM is also submitted. Report indicates that the Peedee aquifer has not been significantly impacted, however, additional off-site assessment will be necessary for confirmation.

deep zone not impacted

[on site is now assessed + had a plan for remediation for July 12 submittal]

1991 (continued)

July 12, 1991 - WaRO receives formal submittal of Corrective Action Plan (CAP) dealing with on-site contamination.

we tried to return to our familiar path → August 20, 1991 - Letter from DEM-GW (Guy Pearce) accepting the proposed on-site CAP and stating that the next step is the development of a Special Order of Consent (SOC) document.

August 29, 1991 - Meeting at WaRO with DuPont-Kentec representatives to discuss the development of the SOC document.

September 18, 1991 - WaRO DEM meets with Central Office DEM to discuss proposed SOC for Kentec.

September 23, 1991 - Memo providing a summary of the September 18, 1991 meeting is sent from Guy Pearce to Jim Mulligan, Roger Thorpe, Dennis Ramsey, and Jeff Lautier.

September 23, 1991 - James F. Hopf of the Law Offices of Marvin Blount requests access to site files.

From October through December 1991 - DEM and DuPont-Kentec negotiate details of SOC.

SOC signature was refused → December 12, 1991 - Meeting with DuPont-Kentec representatives and DEM takes place in the Archdale Building. DuPont-Kentec declines to accept (sign) the SOC that DEM has prepared.

Company met with Director George Everett during this time period

December 23, 1991 - DEM issues a Pump and Haul Permit (permit WQ0005906) which allows the construction and operation of the proposed groundwater remediation system. Permit also allows the construction of a temporary holding pond for dewatering activities necessary to install groundwater interception trench. Penalties are stipulated for failure to meet the construction and operation deadlines established in the permit. In effect, the Pump and Haul Permit will function as a SOC agreement. Permit expiration date is December 31, 1992.

only re completion of the list of tasks in order, but up to them not up to us.

unusual for us to allow construction of WTP under a Pump+Haul.

1992

June 17, 1992 - Pump and Haul Permit (WQ0005906) is amended to allow the use of railcars to transport treated effluent to DuPont-Kinston plant. Please note the permit is now for a Groundwater Remediation System, not Pump and Haul.

schedule + proposed penalty was for future actions only.

1992 (continued)

July 23, 1992 - Sara Ganyard, acting as an agent for Vernon G. Snyder III, requests access to site files.

September 1, 1992 - DEM receives notification (letter) from DuPont-Kentec that the remediation system is up and running. Groundwater quality data gathered just prior to system start-up is included with the letter.

September 3, 1992 - DEM receives request from DuPont-Kentec to renew the Pump and Haul Permit for a Period of five (5) years, based on the anticipated time frame for remediation.

September 15, 1992 - DEM returns the renewal application as incomplete and specifies the additional information needed to review/comment on the request.

September 23, 1992 - DEM-GW (Guy Pearce) inspects the facility and meets with DuPont-Kentec representatives. Based on the inspection, it appears the system is fully operational.

October 13, 1992 - WaRO receives report detailing the volume of water that has been treated and shipped to the DuPont-Kinston Plant in accordance with Pump and Haul Permit No. WQ0005906

October 27, 1992 - Memo from Guy Pearce to Jack Floyd concerning renewal of Pump and Haul Permit. Memo states that we have no objections to permit renewal and that the temporary holding pond has been properly abandoned.

November 9, 1992 - Memo from Jack Floyd to Don Safrit stating that the Groundwater Section does not object to permit reissuance. Memo also recommends that Permit Conditions, Section II Nos. 1, 4, 5, and 6 be deleted since these conditions have been satisfied.

December 9, 1992 - Permit No. WQ0005906 is reissued for five (5) years.

1993

January 22, 1993 - DEM receives request from DuPont-Kentec to re-instate Permit Condition - Section II No. 6, which requires remediation to continue until the target clean-up levels have been met. This condition also ties the permit to the approved Corrective Action Plan.

February 5, 1993 - Memo from Guy Pearce to Jack Floyd which agrees with request from DuPont-Kentec to re-instate Permit Condition, Section II No. 6.

1993 (continued)

February 15, 1993 - Memo from Jack Floyd to Don Safrit recommending request to re-instate Permit Condition Section II No. 6 be granted.

To re-establish target level at which they could stop.

February 15, 1993 - WaRO receives results of November 1992 railcar/groundwater sampling as required by permit WQ0005906.

February 18, 1993 - WaRO receives a copy of CASE MANAGEMENT ORDER for Civil Action No. 91-55-CIV-4-H. One important aspect of this document is that it contains deadlines for:

1. Plantiffs are to conduct scientific testing of soil, groundwater, etc. by May 31, 1993 and submit results of testing to DuPont-Kentec by June 15, 1993.

2. DuPont will have access to, and conduct scientific testing of the plantiffs' property from July 1, through September 30, 1993. The results will be submitted to plantiffs on or before October 15, 1993.

March 15, 1993 - Pump and Haul Permit No. WQ0005906 is reissued with appropriate changes.

Offsite access granted

March 19, 1993 - WaRO receives letter from Marvin Blount, attorney for plantiffs, stating that DuPont-Kentec has been granted access to plantiffs' property. Mr Blount includes a copy of a letter to DuPont, dated February 24, 1993, granting access.

* It should be noted that the above letter was written after the CASE MANAGEMENT ORDER was issued (2/17/93).

March 24, 1993 - WaRO (Guy Pearce) sends letter to DuPont, asking them to move forward with off-site assessment since access has been granted by plantiffs.

March 31, 1993 - DuPont (Jerry Henderson) responds to March 24, 1993 letter from WaRO. DuPont takes the position that the above noted CASE MANAGEMENT ORDER stipulates the time frame for both the plantiffs and DuPont to conduct scientific testing, and that this schedule should be followed.

We acknowledge judge's power to change the schedule -

We examined the file found all reports but one & called DuPont for it & they provided the report.

April 14, 1993 - WaRO receives letter from Marvin Blount stating that DuPont has failed to submit the required quarterly reports required by the approved Corrective Action Plan and Pump and Haul Permit No. WQ0005906. Based on our review, the required reports have been

1993 (continued)

submitted with the exception of the February 1993 report. Guy Pearce telephones DuPont (Jerry Henderson) on April 21, 1993, and asks for results of February 1993 sampling.

April 23, 1993 - WaRO receives letter, dated April 21, 1993, from DuPont containing the above noted sampling results.

April 29, 1993 - In response to telephone conversation between Jerry Henderson and Guy Pearce, WaRO receives letter, dated April 23, 1993, containing water level elevation data for the onsite monitoring wells and information concerning the closure of the temporary holding pond used to store groundwater generated from dewatering during installation of the groundwater interception trench.

June 28, 1993 - WaRO receives letter, dated June 23, 1993, containing the results of the April railcar and groundwater sampling as required by their permit.

June 30, 1993 - WaRO receives letter, dated June 29, 1993, from DuPont, advising DEM that the plantiffs have supplied them with data concerning offsite groundwater conditions. DuPont feels the data is incomplete and has requested additional information, such as logbooks, well construction details, and laboratory supporting data. DuPont also states that they my be barred by a federal confidentiality order from providing DEM with this data.

where was DuPont between July & Sept 30 ?

July 20, 1993 - DEM receives request from DuPont to remove (delete) the permitted daily flow rate restriction so that remediation can be accelerated. Since our review of the submitted effluent sampling/analysis (rail car) indicate the treatment plant is meeting all effluent limits we have no objections to increasing the daily flow rate.

why is there not off site GW data?

August 20, 1993 - Pump and Haul permit is modified to increase the maximum daily flow limit from 7200 GPD to 20,000 GPD.

October 12, 1993 - WaRO receives letter, dated October 7, 1993, from DuPont containing results of July 1993 railcar and groundwater sampling as required by their permit.

DuPont stopped pumping off site 10/15/93

October 15, 1993 - WaRO receives letter from DuPont, dated October 14, 1993, stating, among other things, that a federal judge had indefinitely suspended the time frame (July 1 - September 30, 1993) for DuPont to

conduct scientific testing of plantiffs property. This letter also contains information concerning the results of the plantiffs offsite investigations.

1994

January 6, 1994 - WaRo receives letter from DuPont, dated January 3, 1994, containing results of October 1993 railcar and groundwater sampling as required by their permit.

February 23, 1994 - WaRo receives letter from DuPont, dated February 21, 1994, containing results of October 1993 railcar and groundwater sampling as required by their permit.

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF NORTH CAROLINA
NEW BERN DIVISION

CIVIL ACTION NO. 91-55-CIV-4-H

FILED IN ALL PENDING DUPONT LITIGATION

EDWARD B. GRANT and wife, JANICE C. GRANT,

Plaintiffs,

v.

E.I. DU PONT DE NEMOURS AND COMPANY, INCORPORATED,

Defendant.

AFFIDAVIT OF DOUGLAS G. DRONFIELD

Douglas G. Dronfield, being first duly sworn, deposes and says as follows:

1. I am a senior hydrogeologist and project manager at the consulting firm of CH2M HILL in Reston, Virginia, where I have been employed since 1984. Before joining CH2M HILL, I received a bachelor's degree in environmental science from the University of Virginia in 1982, and a master's degree in groundwater hydrology from the University of Arizona in 1984. I am a registered professional geologist in the state of North Carolina. A more complete statement of my professional qualifications is set forth in my curriculum vitae, which is attached hereto as Exhibit 1.

CH2M HILL

2. CH2M HILL is a multi-disciplinary consulting firm which provides a wide range of technical services, principally for industrial, municipal, and federal clients. CH2M HILL's principal areas of professional service include the investigation

and remediation of environmental contamination, the study and design of water and wastewater treatment systems, environmental management, and regulatory compliance. To provide these services, CH2M HILL retains, among other specialists, individuals with technical expertise in environmental engineering, geology, hydrogeology, waste treatment, and toxicology.

3. CH2M HILL provides consulting services in the areas of investigation and remediation of environmental contamination at both operating industrial facilities and abandoned sites. At such facilities and sites, CH2M HILL routinely provides technical support and advice on the nature and extent of environmental contamination, human health and environmental risks posed by the site, establishment of cleanup levels, selection of appropriate remediation technologies, design of remediation systems, and oversight of remedial construction activities.

4. As part of these facility and site evaluations, CH2M HILL conducts risk assessments to assist clients in assessing the potential for harm to human and ecological populations as a result of chemical releases. These risk assessments are performed by toxicologists, health scientists, and biologists who analyze data related to a release, identify chemicals of concern, identify exposure pathways to receptor populations, calculate exposure doses for those populations, and, based upon the toxicological profiles for the chemicals of concern, assess the risk of present or future harm to the receptor populations.

PROFESSIONAL EXPERIENCE

5. As a hydrogeologist and project manager, my work focuses on projects involving environmental contamination of groundwater, surface water, and soils. I have substantial experience in addressing contamination caused by a wide variety of chemical substances, including chlorinated hydrocarbons, petroleum derived compounds, and other organic compounds, including 1,4-dioxane. Most of these projects involve determining the nature and extent of groundwater contamination, and many have progressed into active groundwater remediation. As part of these projects, I have performed and supervised the following groundwater investigation and characterization activities: installation of groundwater monitoring wells, aquifer testing, groundwater sampling, determination of the vertical and horizontal extent of contaminant plumes, determination of the direction and rate of groundwater flow, and estimation of the fate and transport of contaminants in groundwater systems.

6. I also provide support for members of CH2M HILL's engineering staff on the design, construction, and operation of remediation systems to address groundwater, surface water, and soil contamination. I have been directly involved in the design and operational evaluation of groundwater remediation systems that have included both extraction wells and trench systems for the collection of contaminated groundwater.

7. I have supervised or assisted on groundwater contamination and remediation projects in North Carolina since 1986. Through these projects, I have had substantial interaction

with officials of the North Carolina Division of Environmental Management ("DEM"), which administers the State groundwater quality program and other water quality and environmental protection programs.

GROUNDWATER INVESTIGATIONS

8. Groundwater contamination, either confirmed or suspected, is a common element to most sites and facilities I have worked on. Groundwater exists below the ground surface within the pores or the open spaces of the geologic material. Geologic units from which groundwater can effectively be withdrawn are usually referred to as aquifers. Because of the heterogeneous nature of geologic materials, very often more than one aquifer will exist below a site. If more than one aquifer exists beneath the site, the one nearest the ground is often referred to as the surficial aquifer. This aquifer may be separated from lower aquifers by less permeable geologic units that impede groundwater flow between the two aquifers.

9. The usual first step in the assessment of a site is to plan and conduct environmental sampling to determine the presence or absence of chemical substances and to identify their potential sources. That typically includes a review of past site or facility operations, past users of chemical substances at the facility, disposal practices and an evaluation of the regional hydrogeology.

10. The presence or absence of chemical substances in groundwater is most often determined by installing monitoring wells to obtain actual samples of the groundwater. The extent of groundwater contamination is usually ascertained by installing a

series of monitoring wells progressively downgradient of the suspected source.

11. Samples of the groundwater are typically analyzed in an environmental laboratory. Analysis of samples can focus on suspected chemical substances, if the nature of the source is known, or the analysis can be broader, encompassing hundreds of chemical substances.

12. Hydraulic measurements and testing of the aquifer are often performed to determine physical characteristics of the aquifer that influence the fate and transport of substances. Hydraulic measurements and testing commonly include measurements of the aquifer's hydraulic conductivity and measurement of water levels in monitoring wells. The hydraulic conductivity measurements and water level measurements can be used to estimate the rate at which groundwater flows through the aquifer. By compiling water level measurements from individual wells, potentiometric and equipotential maps may be developed.

13. Where a sufficient number of water level measurements are available, an equipotential map can be developed which will graphically depict the fluid potential level in the aquifer (and in some instances, the height of the water table) in a manner similar to the way that land surface elevations are shown on a surface topographic map. Such maps can often be used to determine the horizontal direction of groundwater flow within the aquifer. The reliability of such maps for that purpose is generally restricted to the area within or immediately adjacent to the perimeter formed by the array of measurement points.

14. The fate and transport of chemical substances in groundwater is also influenced by various properties of the particular substances. Such properties include solubility, volatility, degradability, and preference for adsorption. Chemical substances that are highly soluble tend to remain dissolved in the groundwater and flow generally at the same rate as the groundwater. Such chemical substances usually do not adsorb to solid material in the aquifer to any substantial degree. Chemicals that are volatile tend to evaporate from the water to the air. In addition, chemicals can degrade in the groundwater through biological or non-biological processes. Many organic chemicals degrade to their fundamental components -- carbon dioxide and water. The tendency and rate at which chemical substances degrade is referred to as degradability. As chemical substances flow with the groundwater, they can adsorb, or become fixed, to solids in the aquifer -- sands, clays, and silts. Chemicals that adsorb readily are generally not very mobile and tend to remain close to the original source of contamination.

15. Evaluating the fate and transport of chemical substances in groundwater systems involves consideration of both the properties of the aquifer and of the substances themselves. For example, although a chemical may be considered highly soluble, or mobile, the time it will take for that chemical to travel a set distance will be greatly affected by the rate of groundwater movement. However, chemical substances that are readily adsorbed to clays and silts within an aquifer may not migrate substantially from a source. Therefore, the rate and

direction of groundwater flow should not be used as the sole factor to predict future migration of such substances.

KENTEC PROJECT: BACKGROUND

16. In 1986, CH2M HILL was retained by E.I. du Pont de Nemours and Company ("DuPont") to perform a voluntary groundwater assessment at a parts washing facility (the "Facility") operated by Kentec, Incorporated on property owned by DuPont. The purpose of the assessment was to evaluate possible releases of chemical substances to the surficial groundwater and surface water from the drainfields associated with a biological treatment system located at the Facility. I began working on this project as a CH2M HILL hydrogeologist.

17. During CH2M HILL's assessment, I understood the Facility began operation in 1969 (as stated in all previous CH2M HILL groundwater assessment reports). However, it is now known that the Facility began operations in June 1972 on property then owned by James Enterprises of Pitt County, Inc. ("James Enterprises"). Pursuant to a contract with DuPont, the Facility uses a process to clean pack parts and spinnerets utilized by DuPont to produce synthetic fibers at its Kinston manufacturing facility. Those parts, which accumulate polymers during the manufacturing process, are transported by truck from the Kinston plant to the Facility for cleaning. The parts are first cleaned in a heated solution of triethylene glycol ("TEG"). After parts are removed from the heated TEG, that solution is recaptured and transported out of state for reclamation and reuse. The cleaned parts are then rinsed with water, dried and returned to the DuPont plant where they are placed back into use in the

manufacturing cycle. With minor exceptions, the cleaning process has remained the same from 1972 through the present. It is my understanding that no other industrial operation has ever taken place at the Facility.

18. It is my understanding that 1,4-dioxane is formed when TEG is heated. CH2M HILL believes that 1,4-dioxane, a very water soluble compound, is contained in the water after the pack parts and spinnerets have been rinsed. Between 1972 and the present rinse water has been disposed of in three different ways. From approximately June 1972 until June 1982, the rinse water was disposed of via a french drain at the southeastern corner of the main Facility building. That french drain is believed to have clogged in the early 1970's, causing rinse water to flow on the ground from the Facility building to an open ditch, which carried surface water from the Facility toward the southwest and ultimately to a waterway known as Beaver Dam Branch. The locations of the french drain, the ditch, and Beaver Dam Branch are shown on the attached Exhibit 2.

19. The method of rinse water disposal changed shortly after DuPont acquired the Facility property in October 1981. At that time, DuPont began working with James Enterprises and the North Carolina DEM to design and construct a biological rinse water treatment system at the Facility. This rinse water treatment system, which was fully permitted by the DEM, consisted of two settling tanks, a 10,000 gallon aerobic treatment tank, and three underground drainfields. The location of those drainfields is identified on the attached Exhibit 2. The treatment system became operational in June 1982, and was used

until February 1986. From 1986 to present, DuPont has transported the rinse water out of state for treatment and disposal.

KENTEC PROJECT: PHASE 1

20. Based on the foregoing understanding of the rinse water disposal practices, CH2M HILL initiated the first phase of the groundwater assessment in April 1987. CH2M HILL installed six wells (MW-1 through MW-6) on the facility property during Phase 1. Five of these groundwater monitoring wells surrounded the drainfield and the sixth (MW-6) was placed near State Road 1802. The locations of the six monitoring wells are shown on Exhibit 2. In addition to obtaining and analyzing groundwater samples from these wells, CH2M HILL also collected surface water samples from locations on and off the Facility property during Phase 1.

21. Analysis of samples taken from these wells during Phase 1 indicated the presence of organic compounds in the surficial groundwater beneath the Facility, primarily 1,4-dioxane. Based on these data, CH2M HILL prepared a Phase 1 report recommending: (1) an inventory of all nearby residences to determine if they were using shallow groundwater for potable purposes; (2) sampling and analysis of surface waters adjacent to the Facility property; (3) an additional round of sampling of groundwater from the monitoring wells, with analysis of 1,4-dioxane, volatile organic compounds and TEG; (4) additional sampling of surface water for coliforms; and (5) installation of a background monitoring well. That work was summarized in a report, entitled "DuPont Kentec Progress Report," that was produced in discovery as document number DD000363 -- DD000402.

22. I understand that the residential well inventory recommended by CH2M HILL in its Phase 1 report was subsequently completed in March 1988. This inventory revealed no residences in the immediate vicinity of the Facility that were using wells completed in the surficial aquifer for drinking purposes.

KENTEC PROJECT: PHASE 2

23. CH2M HILL conducted Phase 2 of the groundwater assessment between May and October 1988. During Phase 2, CH2M HILL installed two additional shallow monitoring wells on the Facility property, obtained groundwater samples from all eight monitoring wells, and sampled surface water. Data from these analyses again indicated the presence of 1,4-dioxane, as well as two chlorinated compounds, 1,1-dichloroethane (DCA) and 1,1-dichloroethene (DCE). In addition, CH2M HILL performed in-situ hydraulic conductivity measurements in five of the monitoring wells.

24. Based on the Phase 2 results, CH2M HILL issued a report which recommended: (1) analysis of soil samples from the area which had previously been used as a permitted drainfield for disposal of rinse water; (2) expansion of the monitoring program to include wells screened in the deeper aquifer and additional downgradient shallow wells; (3) analysis of additional surface water and sediment samples; (4) sampling of any downgradient residential wells, even if not in use; and (5) preparation of a topographic map of the site. That report, entitled "Final Draft Groundwater Assessment - Phase 2," was produced in discovery as document number DD03238 -- DD03281.

KENTEC PROJECT: PHASE 3

25. From October 1989 to November 1990, CH2M HILL performed Phase 3 of the groundwater assessment, implementing all the recommendations in the Phase 2 report. At the start of Phase 3, DuPont had acquired additional property adjacent to the Facility, and during Phase 3, monitoring wells were placed in those areas. In addition, CH2M HILL conducted a biomonitoring study in surface waters adjacent to the Facility to evaluate the potential impact of the detected chemical substances on the biological community. The study showed that the 1,4-dioxane detected in the surface water samples did not have an adverse effect on the biological community in the vicinity of the Facility. Finally, CH2M HILL conducted a facility audit in July 1990 to identify potential sources of groundwater contamination from existing and past operations, and to identify methods that could confirm and quantify potential contaminant sources.

26. The audit identified several potential sources of groundwater contamination at the Facility, including the drainfield used for disposal of rinse water from June 1982 to February 1986. Based on the audit and information gathered through the three phases of investigation, CH2M HILL believes that rinse water deposited into the french drain and subsequently into the ground on the southwestern boundary of the Facility from 1972 to 1982 was carried to the nearby creek and ultimately into Beaver Dam Branch. CH2M HILL also concluded from the facility audit that Kentec, Inc (which replaced James Enterprises as DuPont's parts washing contractor in 1985) began using 1,1,1-trichloroethane (TCA) to dry spinnerets in 1987. The facility

audit determined that at some time TCA had been discharged to an underground tank on the south side of the Facility. Based on the audit and interviews with Facility personnel, CH2M HILL believes that the DCA and DCE found in the groundwater are degradation products of TCA.

27. CH2M HILL generated an audit report dated September 4, 1990, which was produced in discovery as document number DD000462 -- DD000478. Based on the recommendations contained in the audit report, DuPont took certain corrective actions at the Facility between November 1990 and March 1991 to minimize or eliminate potential sources of groundwater contamination. These corrective actions included the removal of three underground settling tanks, the installation of fiberglass sleeves in an on-site wet well, the replacement of cracked PVC in the rinse water distribution system, the removal of contaminated soil near State Road 1802, and the cleaning and sealing of dikes and floors. Although the rinse water drainfields were, while in use, a likely source of 1,4-dioxane to the groundwater, CH2M HILL did not recommend corrective action regarding the drainfields since they did not appear to present a current source of contamination.

28. CH2M HILL made several recommendations as part of the April 1991 "Groundwater Assessment Report," submitted after the conclusion of Phase 3 and the Facility audit. That report was produced in discovery as document number DD002983 -- DD003168. The purpose of those recommendations was to bring the investigative phase of the assessment to a conclusion and to address further the need for remediation at the Facility. The recommendations were: (1) characterization of the extent of

contamination in the surficial aquifer beyond the boundaries of the Facility; (2) study of the Peedee aquifer, particularly in the vicinity and downgradient of PW1; and (3) development of a corrective action plan to address surficial groundwater contamination at the Facility.

29. To address the characterization of potential contamination beyond the Facility, CH2M HILL recommended in 1990 that monitoring wells be placed on residential properties downgradient of the Facility to determine whether the contamination plume had spread off of the Facility property and, if so, to determine the outward edge of the plume. The wells would be used to determine the concentrations of levels for any contaminants discovered in groundwater samples from neighboring properties. The locations of those recommended wells are shown on Exhibit 3. At the time of those recommendations, CH2M HILL had met with representatives of the North Carolina DEM on several occasions to discuss the status of the assessment. In those meetings, CH2M HILL and the North Carolina DEM agreed that information about possible off-site contamination would assist CH2M HILL in preparing a corrective action plan and in determining whether active remediation of groundwater contamination at the Facility would be sufficient to address the problems identified through the assessment, or whether active remediation of adjacent properties would also be necessary. DuPont applied for and received a permit to install six off-site monitoring wells in January 1991.

30. It is my understanding that DuPont approached property owners Bruce and Janice Grant, Donnie and Peggy Stancill, and

Robert and Ruth Brooks in or about November 1990 to request permission to install monitoring wells on their properties. Through their attorneys, the Grants and Stancills denied CH2M HILL access to their properties for this purpose. Thereafter, CH2M HILL reported to the North Carolina DEM its inability to perform the subsurface investigations on adjacent properties as planned. Because CH2M HILL was unable to obtain information regarding possible off-site contamination, the DEM allowed DuPont to prepare a corrective action plan for remediation of chemical substances in groundwater in the surficial aquifer at the Facility.

PEEDEE AQUIFER STUDY

31. As part of its groundwater assessment, CH2M HILL also undertook a more detailed study to determine whether any migration of the chemical substances to the deeper Peedee aquifer had occurred. In late 1990, CH2M HILL sampled water from an inactive water supply well at the Facility which extended into that deeper aquifer. Testing of those samples revealed the presence of 1,4-dioxane in the groundwater. Subsequent testing of samples from eight Peedee aquifer monitoring wells and six residential wells revealed that the 1,4-dioxane detected in the water supply well was not detectable within the rest of the Peedee aquifer. The results of that study are summarized in a July 1991 report entitled "Kentec Groundwater Assessment Onsite Peedee Aquifer Addendum," produced in discovery as document number DD002046 -- DD002124. CH2M HILL concluded that any 1,4-dioxane in the production well had migrated from the surficial aquifer to the Peedee aquifer along the well casing. At CH2M

HILL's recommendation, DuPont properly abandoned the water supply well in December 1990 to ensure that no further 1,4-dioxane would migrate along the well casing to the Peedee aquifer.

1991 CONCLUSIONS REGARDING KENTEC CONTAMINATION

32. Based on the three phases of groundwater assessment and the Facility audit, I have reached several conclusions regarding the nature and extent of chemical substances in the surficial aquifer at the Facility prior to startup of the remediation system. The conclusions, as well as the basis for the conclusions, are presented in the April 1991 Groundwater Assessment Report.

33. The hydrogeologic system at the Facility consists of a surficial aquifer which is approximately 4 to 10 feet thick and contains primarily sand and silty sand. The depth to the water table is approximately 4 feet at the Facility; however, it fluctuates seasonally. Beneath the surficial aquifer is the Peedee formation. The upper part of the Peedee consists of an approximate 20-ft-thick, clayey, sandy silt layer. The silt layer grades into the sandy layer of the Peedee formation. The sandy layer of the Peedee formation is locally considered the Peedee aquifer.

34. Surficial aquifer groundwater is not used for drinking purposes in the vicinity of the Facility. The Peedee aquifer is used regionally for water supply.

35. The surficial aquifer groundwater beneath the Facility includes concentrations of certain chemical substances, primarily three organic compounds: 1,4-dioxane, DCA, and DCE. The concentrations and distribution of these chemical substances at

each monitoring point in January, 1990, prior to remediation, are shown in Exhibit 4.

THE CORRECTIVE ACTION PLAN

36. A corrective action plan ("CAP") for the Facility was initiated in the spring of 1991 and approved by the North Carolina DEM on April 20, 1991. Such a plan develops, evaluates and selects an alternative for remediation of contaminated groundwater. The Kentec CAP focused upon remediating three primary substances: 1,4-dioxane, DCA and DCE. Those substances had been found within the surficial aquifer at the Facility and were likely degradation products of substances used during Facility operations. They were also the primary compounds of concern for the North Carolina DEM.

37. The CAP, as approved by the North Carolina DEM, included target cleanup levels for each of the three chemicals. Specifically, the cleanup level for DCE was set at seven parts per billion, the established State Subchapter 2L groundwater standard. At the time of the CAP, DCA did not have an established Subchapter 2L standard, and its cleanup level was therefore set at the same level as DCE, seven parts per billion. Since then, the State drinking water standard for DCA has been set at 700 parts per billion, but DuPont has not requested the North Carolina DEM to revise the target cleanup level for that substance. The CAP set the target cleanup level for 1,4-dioxane at 150 parts per billion. The North Carolina DEM approved that target level because it reflects the detection limit for the analytical method suggested by EPA for determining the presence of 1,4-dioxane.

THE REMEDIATION SYSTEM

38. CH2M HILL supervised the installation of a remediation system, which has been operating at the Facility since August 1992. The system employs a four-legged interceptor trench buried at a depth of six to 15 feet. The approximate location of the trench on the Facility premises is shown on the attached Exhibit 5. This 2,500-foot interceptor trench functions as a collection device for contaminated groundwater located within the surficial aquifer at the Facility. All groundwater collected is then treated in a chemical oxidation unit, with the treated groundwater shipped off-site for disposal.

39. The interceptor trench was designed to prevent chemical substances from migrating off of the Facility property and to remove and treat chemical substances within the Facility boundaries to the State approved cleanup levels. It was further designed to allow groundwater from adjacent properties such as those owned by the Plaintiffs to flow towards the trench and be collected. As discussed further below, the trench indeed appears to have exerted an influence on groundwater located in the area immediately outside the trench. At times, it has more likely than not pulled groundwater off of the Bruce and Janice Grant property towards the collection trench.

40. CH2M HILL has assisted in providing quarterly monitoring reports to the North Carolina DEM since the remediation system began operating in August 1992. The reported data has included the levels of 1,4-dioxane, DCA and DCE in all monitoring wells and surface water samples, the levels of those

compounds in the effluent from the treatment system, and the water elevations in all monitoring wells.

CONCLUSIONS REGARDING PLAINTIFFS' PROPERTIES

41. CH2M HILL has also been retained by Moore & Van Allen to assist in defending this action on DuPont's behalf. In that regard, I have provided several opinions concerning: (1) the current nature and extent of contamination in the Kentec neighborhood; (2) the effectiveness of the groundwater remediation system initiated by DuPont at the Facility; and (3) the potential, if any, for future migration to the Plaintiffs' properties of chemical compounds within the groundwater. In reaching my opinions, I have reviewed materials prepared by experts retained by the Plaintiffs. For example, I have reviewed two affidavits executed by Dr. Richard Spruill on June 11, 1993, and August 13, 1993, and the materials attached thereto. I have also reviewed an affidavit signed by Dr. Richard A. Ellis on June 9, 1993, along with the attachments to that affidavit. In addition, I attended the deposition of Dr. Spruill, and reviewed portions of the written transcripts for the depositions of Dr. Ellis and Dr. Spruill. Finally, I have reviewed affidavits filed concurrent with this affidavit by Jay Vandeven and Henry J. H. Harris.

42. On October 27 and 28, 1993, CH2M HILL measured water levels in monitoring wells installed by CH2M HILL on the Facility property, and in the nine monitoring wells placed on properties owned by Plaintiffs Bruce and Janice Grant, Robert and Ruth Brooks, and Andy and Tina Taylor. At this time, monitoring well elevations were also surveyed. Exhibit 6 is a table of the water

levels we measured. Exhibit 7 is a figure showing the Plaintiffs' monitoring wells, the monitoring wells at the Facility and the location of the interceptor trench. After examining those measurements, the data generated by the Plaintiffs' experts, data compiled by CH2M HILL during the groundwater assessment, and quarterly monitoring data reported to the North Carolina DEM pursuant to the corrective action plan, I have drawn a number of additional conclusions about the groundwater system since the remediation system has been in operation.

43. In reviewing all available data related to this situation, I see no evidence of current contamination of the Peedee aquifer. Rather, all data show that the plume of contamination is contained within the surficial aquifer.

44. In my opinion, there is presently no evidence that groundwater under properties owned by Plaintiffs Wallace and Edna Jones, Marian Kittle and William Clark, Kenneth and Barbara Stancill, Donnie and Peggy Stancill, Roy and Brenda Hughes, Dean Grant, Margie Grant, William and Mary Corbett, or Andy and Tina Taylor is now or has ever been contaminated. No groundwater samples have ever been taken from monitoring wells on the properties owned by any of these Plaintiffs other than the Taylors. Two monitoring wells have been installed into the surficial aquifer at the Taylor property, but samples taken from those wells have revealed no contamination. Moreover, CH2M HILL has taken samples from residential wells on properties owned by Wallace and Edna Jones, William and Mary Corbett, Charles and

Linda Braxton, C.L. and Kimberly Braxton, and Ruby and Ben Singleton. Analysis of these samples revealed no contamination.

45. Based upon the most recent data available, there is no groundwater contamination on the property owned by Robert and Ruth Brooks. In 1991, DCE was reportedly detected by Plaintiffs' experts at a concentration of 4 parts per billion, and 1,4-dioxane was estimated at 6 parts per billion, in groundwater sampling on the Brooks property. Neither of those concentrations exceeded the North Carolina 2L groundwater standards requiring clean up. In 1992, groundwater sampling on the Brooks' property did not detect any chemical substances. Exhibit 8 summarizes groundwater data collected in monitoring wells on Plaintiffs' properties.

46. Based upon the most recent data available, chemical substances have been detected on only one of the Plaintiffs' properties, the property of Bruce and Janice Grant. The groundwater sampling by the Plaintiffs shows that the chemical substances' levels on the Grant property have been decreasing over time. The most recent sampling shows that DCE, DCA and 1,4-dioxane were not detected above the 2L groundwater standards in any of the monitoring wells on that property.

47. In my opinion, the level of chemical substances observed in wells from the Grant property will continue to drop in the future largely because the pumping of groundwater from the leg of the interceptor trench between the Facility and the Grant property has impeded the flow of groundwater from the Facility to that property. The reasons for my opinion are set forth below.

48. First, as discussed in paragraph 46 above, existing data show that the concentrations of DCE, DCA and 1,4-dioxane on the Grant property have been decreasing over time. Secondly, concentrations of all three of those substances have fallen below detectable levels in monitoring wells MW-10A and MW-11A. These two monitoring wells are located between the Grant property line and the southern leg of the interceptor trench. These monitoring wells were established in the CAP as downgradient monitoring points to evaluate the effectiveness of the remediation system. Finally, water level data in the two most recent rounds of measurements (April 1993 and October 1993) suggest that, if anything, groundwater on the Grant property now flows towards the interceptor trench.

49. It is my opinion that the low concentrations of chemical substances that were observed on the Grant property during the most recent sampling will be further reduced by various chemical and physical processes previously discussed in this affidavit. In addition, dilution of the substances' concentrations by rainfall infiltrating to the surficial aquifer will likely reduce these substances' concentrations to below detectable levels on the Grant property.

50. Although one of Plaintiffs' experts, Dr. Ellis, states in his affidavit that the properties owned by Wallace and Edna Jones and Marian Kittle and William Clark are presently contaminated, the Plaintiffs have presented no data supporting that statement. The report attached to Dr. Spruill's affidavit of June 11, 1993, states that analysis of sediments collected from a single location at the bottom of a pond located between

the Kittle/Clark and Jones properties revealed elevated levels of toluene. However, it is my understanding that pond does not extend onto either the Kittle/Clark or Jones properties. Additionally, I am unaware of any sampling or analysis of those properties which has indicated the presence of any contamination by the chemical substances at issue.

51. In his first affidavit, Dr. Spruill speculates that the toluene found in the pond between the Kittle/Clark and Jones properties may have been released from the Facility. In my opinion, this statement is incorrect and unsupported. None of the samples taken by Dr. Spruill and Dr. Ellis from wells located between the Facility and the pond revealed any toluene. Moreover, in reviewing the history of Facility operations during the groundwater assessment and Facility audit, CH2M HILL found no evidence that substances containing toluene had ever been used in sufficient quantities at the Facility to cause contamination at the levels apparently observed in the pond. Had releases from the Facility been the source of toluene contamination in the pond, higher levels of toluene would almost certainly have been found in groundwater samples taken at the Facility, and on properties owned by the Plaintiffs adjacent to the Facility.

52. It is further my opinion that the data presently available do not support a conclusion with any certainty that groundwater flow patterns in the area would result in groundwater traveling from the Facility to the pond in question. Although Groundwater Management Associates attempted to construct two equipotential maps showing possible patterns of groundwater flow under the Facility and the Taylor, Brooks, Hughes and Grant

properties, those maps do not include water level measurements from any wells located in close proximity to the pond. Thus, insufficient data exists to determine with any degree of certainty whether groundwater flows from the Facility property to the pond. Even if such evidence did exist, however, that data alone would not automatically establish that chemicals released into the groundwater at the Facility would reach the pond. Rather, the characteristics of the aquifer and the specific compound at issue would also significantly affect the extent to which that compound will travel within groundwater.

53. I strongly disagree with the conclusion in Dr. Spruill's affidavit that the remediation system at the Facility is not an effective remedial action system. As discussed in paragraph 48 above, the data indicate that the remediation system appears to be preventing the migration of chemical substances from the Facility into the groundwater of the Plaintiffs' properties.

54. To the extent that Dr. Spruill bases his opinion regarding the effectiveness of the remediation system upon his assertion that the system has failed to reverse the hydraulic gradient for groundwater in the surficial aquifer, his opinion appears to be based upon a misunderstanding of the objective of the system. That objective is to prevent the migration of chemical substances from the Facility property to neighboring properties -- not necessarily to reverse groundwater flow in the vicinity. However, the data as discussed in paragraph 48 indicate that the remediation system may indeed be reversing groundwater flow on parts of the Grant property.

55. In my opinion, it is extremely unlikely that chemical substances in the surficial aquifer groundwater will travel from the Facility property to the groundwater underneath the properties owned by Andrew and Tina Taylor and William and Mary Corbett. All data suggest that surficial aquifer groundwater flows from those properties toward the ditch which runs along the northwestern boundary of the Facility property. That ditch functions as a groundwater divide which serves as a barrier to the migration of substances in the surficial aquifer from the Facility.

56. In sum, from the most recent data, the only chemical subtances currently in groundwater off of the Kentec facility property are located in the surficial aquifer on the property owned by Bruce and Janice Grant. In my opinion, there is presently insufficient data to determine with reasonable certainty whether that contamination will leave the Grant property in the future, and how far it might travel if it does.

57. In my opinion, based on the current groundwater conditions, it is extremely unlikely that substances in the surficial groundwater aquifer on the Grant property and the Facility property will migrate to the properties owned by Wallace and Edna Jones, Marian Kittle and William Clark, Kenneth and Barbara Stancill, Donnie and Peggy Stancill, Andrew and Tina Taylor, or William and Mary Corbett. While it is conceivable that such substances could eventually migrate to properties owned by Margie Grant, Dean Grant, Robert and Ruth Brooks, or Roy and Brenda Hughes, I do not believe this will happen.

County of Fairfax
State of Virginia

This the 30 day of March, 1994

Douglas G. Dronfield

Sworn to and subscribed before me
this 30th day of March, 1994.

Linda S. McCarthy
Notary Public

My Commission Expires:

November 30, 1994

DOUGLAS G. DRONFIELD, P.G.
Senior Hydrogeologist/Project Manager

Education

M.S., Groundwater Hydrology, University of Arizona, 1984
B.A., Environmental Science, University of Virginia, 1982

Experience

Mr. Dronfield has been employed as a hydrogeologist by CH2M HILL in Reston, Virginia, for the past 10 years. In 1992 and 1993 Mr. Dronfield was the manager of the Earth Sciences and Engineering Department for CH2M HILL in Reston. He is currently a senior hydrogeologist and project manager.

Mr. Dronfield specializes in the assessment of groundwater contamination from solid and hazardous-waste sites; design of groundwater remediation systems; computer modeling of groundwater flow, contaminant transport, and geochemical speciation; evaluation of groundwater resources; and dispersion of fluids within fractured rock. He provides senior technical support throughout the East Coast to CH2M HILL staff in the groundwater discipline. He has extensive experience in hydrogeological evaluation and management of groundwater contamination investigations in North Carolina.

As project manager and senior hydrogeologist for groundwater investigation and remediation studies for DuPont at the Kinston and Cape Fear facilities in North Carolina, Mr. Dronfield's responsibilities included project management; client-state-EPA negotiations; RCRA, RFA, and RFI work plans; monitoring-well installation; groundwater, surface water, soil, and biota sampling; and hydrogeologic data collection and geochemical interpretation. Compounds detected in the environment included primarily chlorinated hydrocarbons.

Mr. Dronfield was the project manager and senior hydrogeologist for the groundwater remediation work at the DuPont parts cleaning facility in Grifton, North Carolina. A groundwater investigation, alternatives evaluation, and design and oversight of groundwater remediation construction were all performed at this facility. The contaminants of concern were 1,1-DCE, 1,1-DCA and 1,4-dioxane. The alternative selected and implemented included the installation of a 2,000-foot groundwater-interceptor trench and groundwater treatment using chemical oxidation. The remediation system has been operational for approximately 2 years.

As project manager and senior hydrogeologist for a soil and groundwater investigation and remediation project near Charlotte, North Carolina, Mr. Dronfield is responsible for all phases of the work. At this industrial facility, solvent and petroleum compounds were

detected and have caused noncompliance with the North Carolina 2L and 2N regulations. Negotiations with the state during the Comprehensive Site Assessments and Corrective Action Plans have been ongoing. Field investigations have included the installation of groundwater monitoring wells, sampling of groundwater, surface water, and soil and conducting aquifer testing.

Mr. Dronfield is the senior hydrogeologist for a RCRA corrective action RFI for a major chemical company in Greenville, North Carolina. The project includes evaluating six SWMUs: a landfill, pesticides disposal areas, and solvent and waste-oil storage areas. The project includes negotiations with EPA Region IV and the NCDEHNR hazardous waste section.

Mr. Dronfield is the program manager for a RCRA, RFI, CMS, and CMI at Oceana NAS in Virginia Beach, Virginia. The work involves environmental evaluation and assessment of contamination at 17 different SWMUs. The sites include liquid hazardous-waste disposal pits, landfills, waste-solvent disposal areas, pesticide storage areas, hazardous-waste spill areas, and fire-fighting training facilities. Mr. Dronfield is responsible for all aspects of the work, including writing work plans, sampling plans, and health and safety plans; conducting fieldwork; and writing interpretative reports containing recommendations. The fieldwork has included installing more than 45 groundwater-monitoring wells; soil-gas sampling; collecting groundwater, surface water, soil, and sediment samples for chemical analysis; and conducting *in situ* hydraulic-conductivity (slug) tests. Three of the SWMUs are currently in the CMS phase, four are in the RFI phase, five are in a fast track CMS/CMI phase, and five have been completed.

Mr. Dronfield was project manager and lead hydrogeologist for a remedial investigation (RI) at the Camp Allen landfills at Norfolk Naval Base. The project involved evaluating the transport of chlorinated solvents in multiple aquifers. Tasks Mr. Dronfield was responsible for included drilling and installation of 29 monitoring wells; sampling of groundwater, surface water, and sediment; sampling of 55 offsite residential wells; interpretation of hydrogeologic data; and presentations to a technical review committee and community groups. Mr. Dronfield was also the senior hydrogeologist on the remediation design and oversight at a PCB removal action at Norfolk Naval Base.

As lead hydrogeologist, Mr. Dronfield worked on a Feasibility Study (FS) of groundwater contamination at a 30-acre fuel-farm site at NAS, Patuxent River. Contamination, consisting of free-product and dissolved phases, has resulted from leaks from five 100,000-gallon underground jet-fuel tanks and one 500,000-gallon tank. In addition to petroleum-related compounds, chlorinated organic compounds, including TCE, are present because of past waste disposal in the vicinity of the site. The FS recommended a remediation system consisting of a 1,700-foot interceptor trench supported by a sheet-pile wall; free-product treatment; iron removal; and air stripping. Mr. Dronfield was involved in preparing the

design and bid specification package and the construction oversight for groundwater-extraction wells and the interceptor trench.

As part of a CH2M HILL contract with the U.S. Environmental Protection Agency, Mr. Dronfield was responsible for data evaluation and interpretive writing of the RI report assessing the extent of surface and subsurface contamination at the Chisman Creek Superfund site in Yorktown, Virginia. This site is on a tidal estuary of the Chesapeake Bay. Mr. Dronfield also was involved in preparing the FS assessing applicable corrective action alternatives. He is the senior hydrogeologist on a CERCLA remedial design for groundwater contamination at the William Dick Lagoon and Cryochem sites in Pennsylvania. Both projects are located in complex fractured bedrock aquifers and will require groundwater extraction and treatment of chlorinated solvent compounds.

Membership in Professional Organizations

National Groundwater Association
American Geophysical Union
International Association of Hydrologists

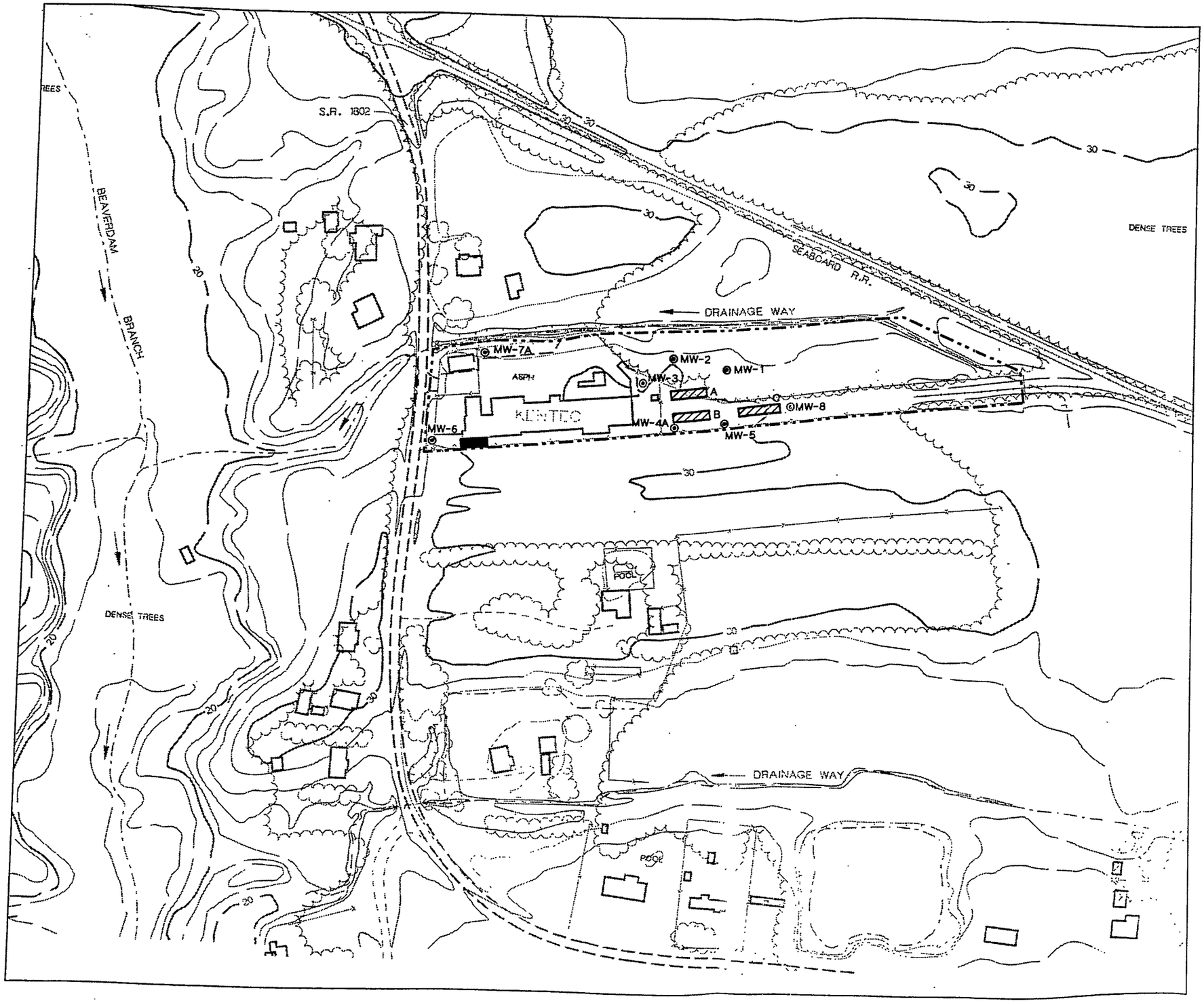
Publications and Presentations

D. G. Dronfield and S. E. Silliman, "Velocity Dependance of Dispersion for Transport Through a Single Fracture of Variable Roughness." Water Resources Research. Vol. 29, No. 10. October 1993.

With S. J. Druschel and J. Vandeven. "NAPL Collection System for Difficult Terrain." HMCRI 92 Conference. November 30 - December 4, 1992.

With M. A. Ibison, T. J. Buchanan. "Aquifer Storage and Recovery in Virginia: An Innovative Water Supply Alternative." American Water Resources Association, Future Availability of Groundwater Resources. April 1992.

Defining Remedial Objectives. Presented at Executive Enterprise Course: Controlling the Environmental Remediation Process and Cost. Washington, D.C. March 1991.



N

LEGEND

- ◉ PHASE 1 AND 2 MONITORING WELL
- ▨ RINSE WATER DRAINFIELD (1982-1986)
- ·—·—· PROPERTY BOUNDARY DURING PHASES 1 AND 2
- ▬ FRENCH DRAIN (1972-1982)

NOTE: BASE MAP COMPILED FROM AERIAL PHOTOGRAPHY FLOWN ON 2/10/89.

0 100 200 300

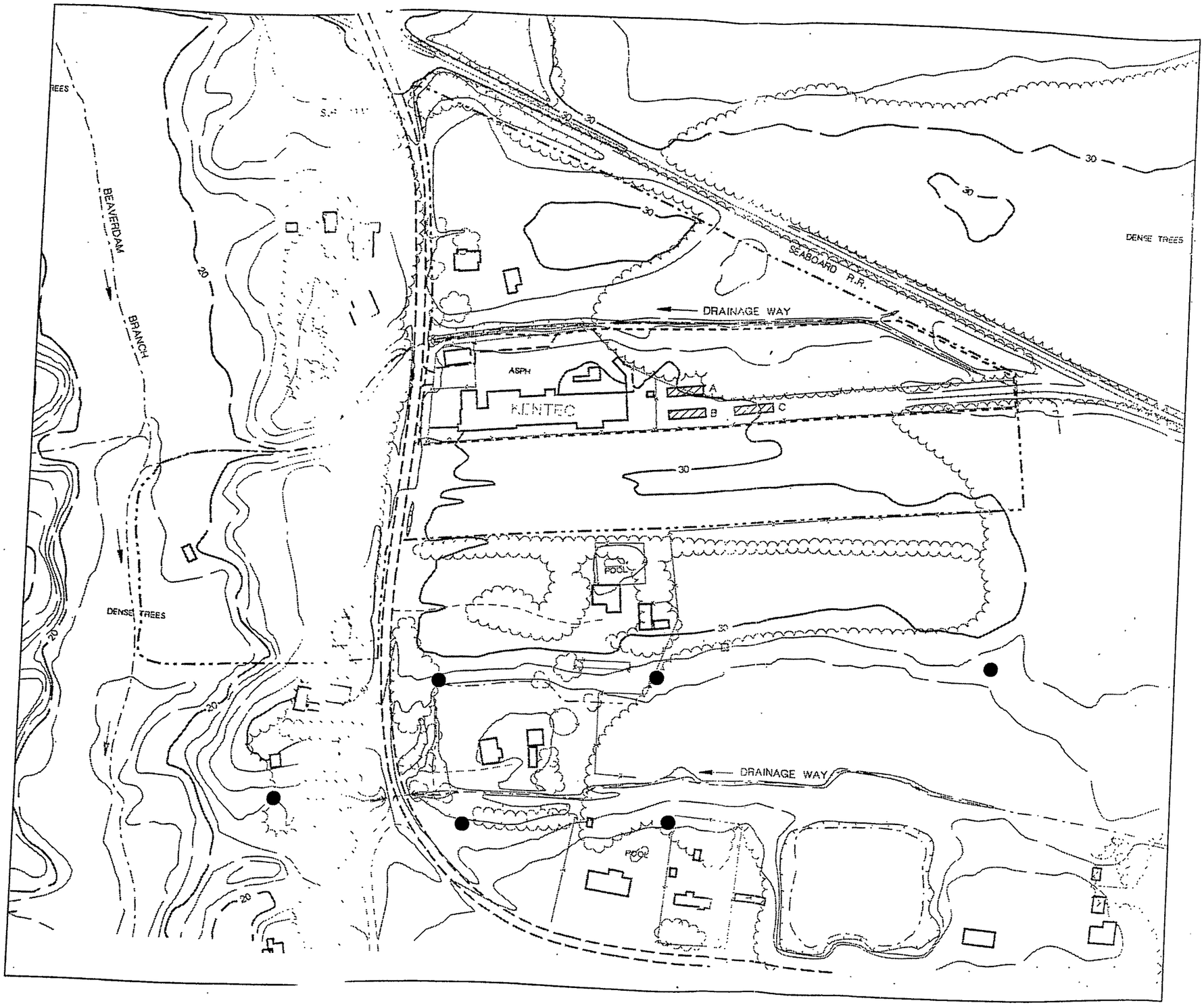
SCALE: 1"=200'

Exhibit 2

PHASE 1 AND 2 GROUNDWATER SAMPLING LOCATIONS Du Pont Kentec Facility

CH2MHILL

6629ex02.dgn 28-Mar-1991



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LEGEND

● PROPOSED MONITORING WELL IN JANUARY 1991

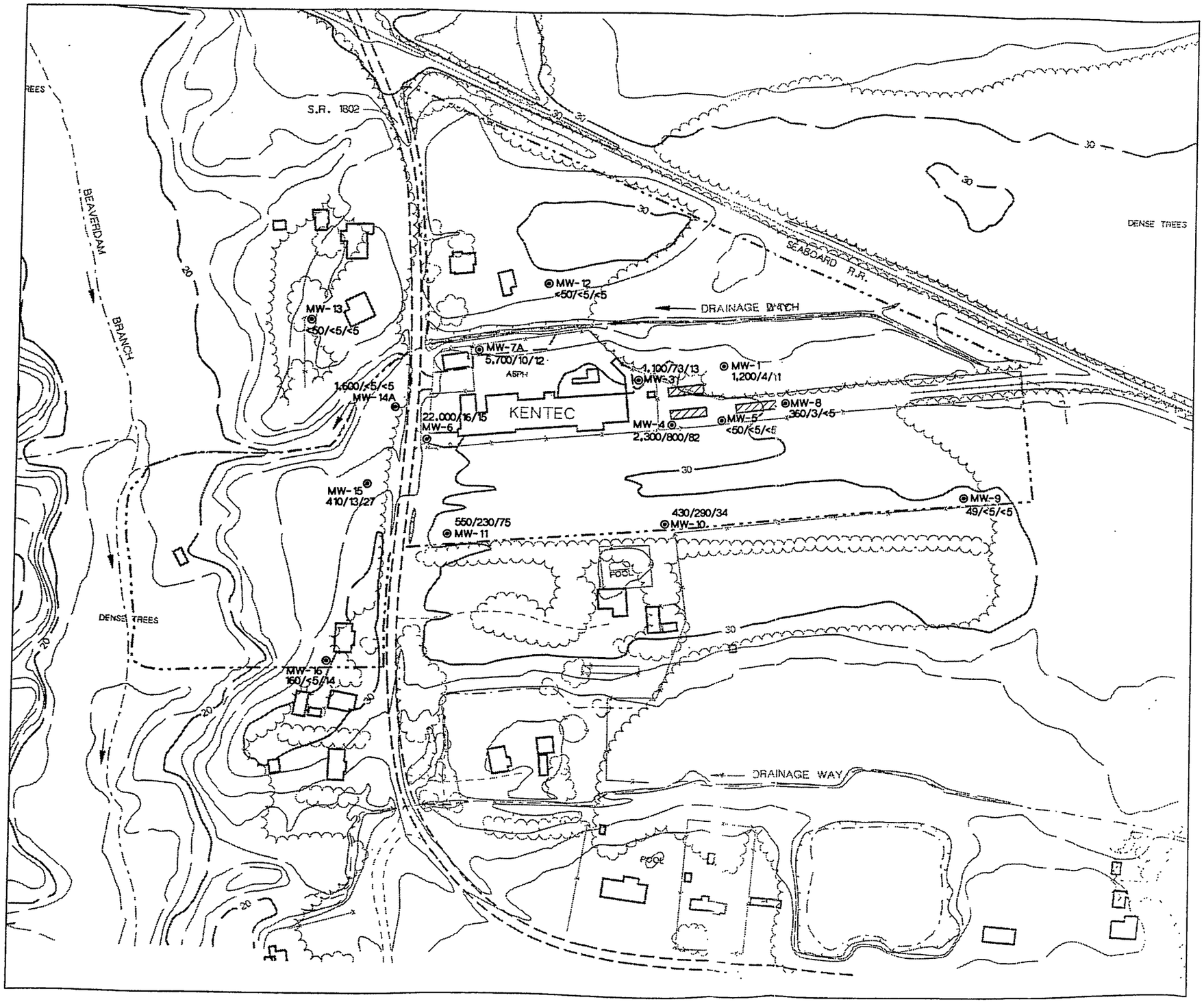
NOTE: BASE MAP COMPILED FROM AERIAL PHOTOGRAPHY FLOWN ON 2/10/89.

0 100 200 300

SCALE: 1"=200'

Exhibit 3

PROPOSED OFFSITE MONITORING WELLS
Du Pont Kentec Facility



LEGEND

⊙ MONITORING WELL

1,100/73/13 1,4-DIOXANE/1,1-DICHLOROETHANE/ 1,1-DICHLOROETHYLENE

CONCENTRATIONS IN ug/l

NOTE: BASE MAP COMPILED FROM AERIAL PHOTOGRAPHY FLOWN ON 2/10/89.

0 100 200 300

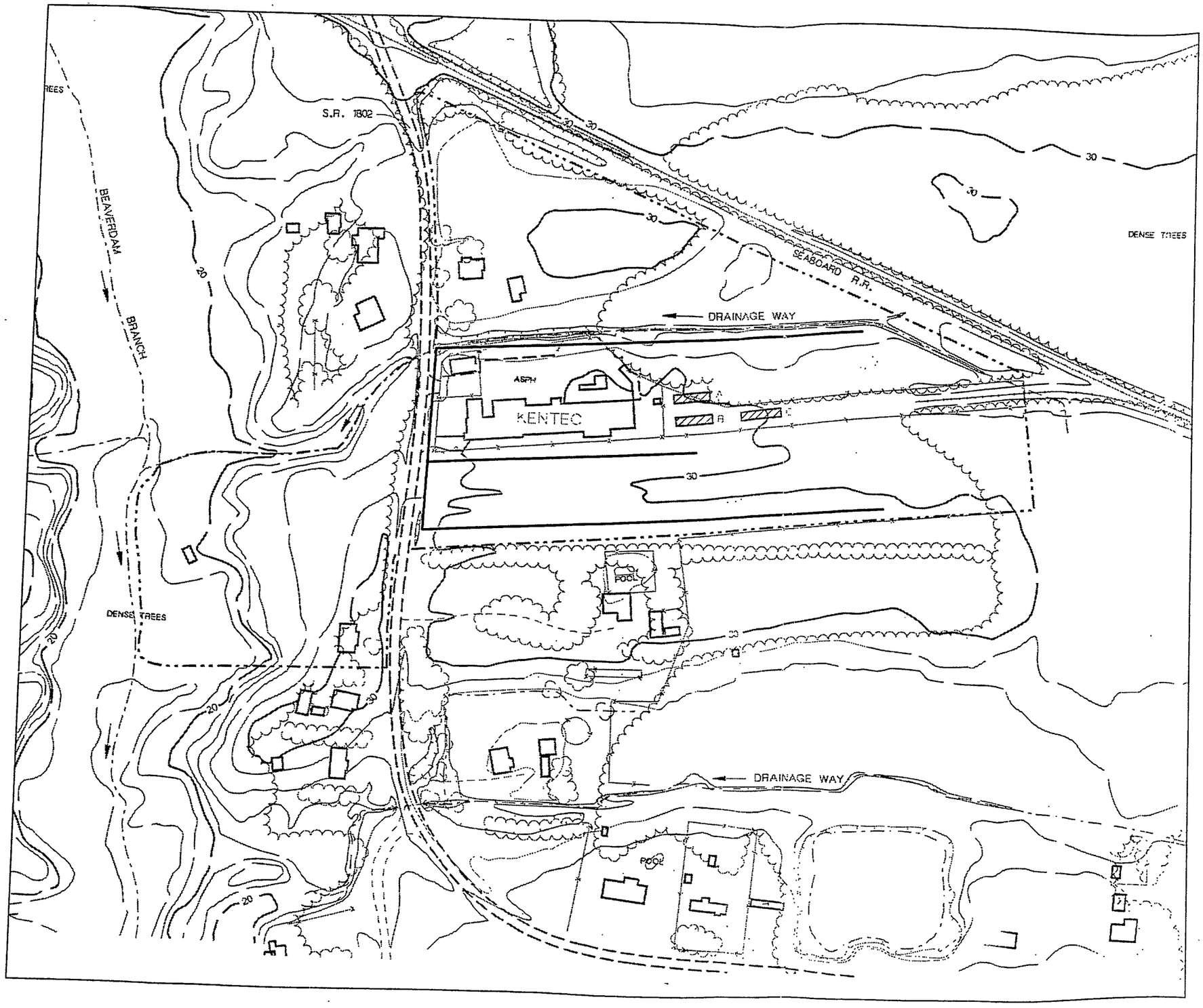
SCALE: 1"=200'

Exhibit 4

CONCENTRATIONS OF 1,4-DIOXANE, 1,1-DICHLOROETHANE & 1,1-DICHLOROETHYLENE IN SURFICIAL AQUIFER GROUNDWATER JANUARY 1990 Du Pont Kentec Facility

CH2MHILL

6629ex05.dgn 20-Mar-1991



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LEGEND

INTERCEPTOR TRENCH LOCATION

NOTE: BASE MAP COMPILED FROM AERIAL PHOTOGRAPHY FLOWN ON 2/10/89.

0 100 200 300

SCALE: 1"=200'

Exhibit 5

INTERCEPTOR TRENCH LOCATION

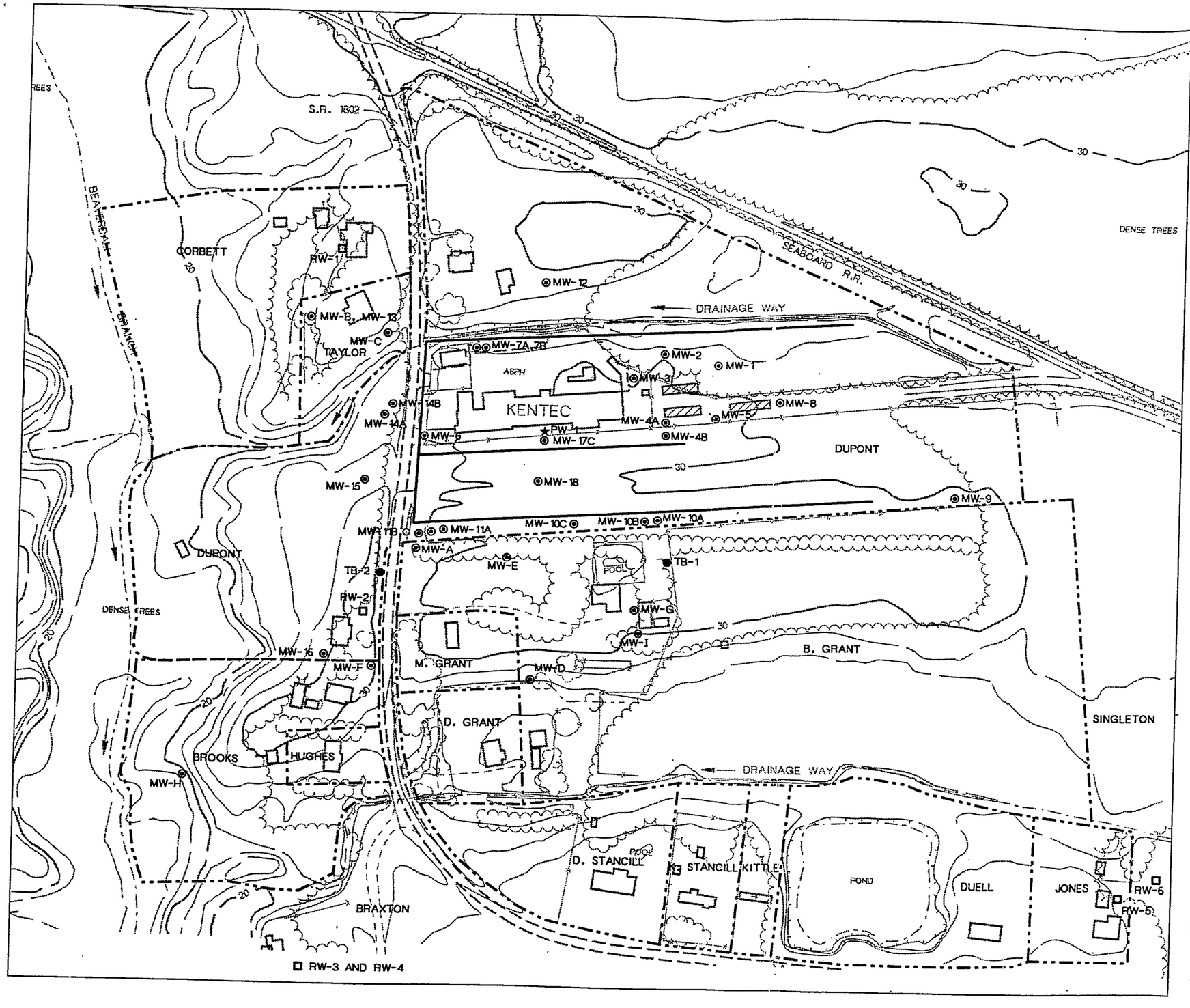
Du Pont Kentec Facility

CH2MHILL

629ex06.dgn 28-Mar-1991

Exhibit 6
Water Level Elevations
October 27 - 28, 1993

Monitoring Well Number	Groundwater Elevation (ft above sea level)	Depth to water (feet)
MW-A	23.52	5.80
MW-B	22.87	4.26
MW-C	21.34	5.87
MW-D	23.70	3.85
MW-E	23.51	7.21
MW-F	23.52	7.96
MW-G	23.50	7.75
MW-H	16.54	3.85
MW-I	22.96	6.84
MW-1	23.89	7.33
MW-4A	23.69	9.31
MW-4B	21.28	11.95
MW-6	23.26	7.45
MW-7A	24.46	5.72
MW-7B	21.40	9.13
MW-8	23.60	7.58
MW-9	23.45	9.33
MW-10A	23.46	9.64
MW-10B	20.96	12.04
MW-11A	23.44	9.38
MW-11B	20.86	12.25
MW-14A	22.34	6.14
MW-14B	21.20	6.13
MW-15	22.26	6.70
MW-16	23.36	6.14
MW-18	23.68	6.85
Note - Elevations are based on NGVD29 originated from NCGSM "BARBQ".		



LEGEND

- COLLECTION TRENCH LOCATION
- MONITORING WELL
- RESIDENTIAL WELL
- PRODUCTION WELL
- TEMPORARY BORING
- PROPERTY BOUNDARY

NOTE: BASE MAP COMPILED FROM AERIAL PHOTOGRAPHY FLOWN ON 2/10/89. PROPERTY BOUNDARIES ARE ESTIMATED.

0 100 200 300

SCALE: 1"=200'

Exhibit 7

WELL LOCATIONS AND PROPERTY BOUNDARIES Du Pont Kentec Facility

CH2MHILL

6629ex07.dgn 21-oct-1993

Exhibit 8
Groundwater Data from Plantiffs Monitoring Locations
(All concentrations in ppb)

Well Number	Property	Date	Sampled by	Chloro-ethane	1,1-Dichloro-ethene	1,1-Dichloro-ethane	Triethylene glycol	1,1,1-Trichloro-ethane	1,4-Dioxane
(MW-1) MW-A	B. Grant	6/13/91 12/15/92	Ellis GMA	69 <5	26 <5	53 9.8	<50,000 NA	<4 6.0	44 J <50
(MW-13) MW-B	Taylor	1/90	CH2M HILL	<10	<5	<5	<250	<5	<50
MW-C	Taylor	12/15/92	GMA	<5	<5	<5	NA	<5	<50
MW-D	B. Grant	12/15/92	GMA	<5	<5	<5	NA	<5	<50
MW-E	B. Grant	12/15/92	GMA	<5	<5	<5	NA	<5	<50
(MW-3) MW-F	Brooks	6/13/91 12/15/92	Ellis GMA	<5 <5	4 <5	<5 <5	<50,000 NA	<5 <5	6 J <50

Exhibit 8
Groundwater Data from Plantiffs Monitoring Locations
(All concentrations in ppb)

Well Number	Property	Date	Sampled by	Chloro-ethane	1,1-Dichloro-ethene	1,1-Dichloro-ethane	Triethylene glycol	1,1,1-Trichloro-ethane	1,4-Dioxane
(MW-2)	B. Grant	6/16/91	Ellis	44	23	270D	<50,000	<5	35 J
MW-G		12/15/92	GMA	<5	<5	7.7	NA	<5	<50
		4/16/93	GMA	28.9	2.3 J	3.3 J	NA	<5	<100
MW-H	Brooks	4/16/93	GMA	<5	<5	<5	NA	<5	<100
MW-I	B. Grant	3/3/93	GMA	<5	<5	<5	NA	<5	< 100
TB-1	B. Grant	4/16/93	GMA	<5	<5	<5	NA	<5	<100
TB-2	SR1802 Right of way	3/22/93	GMA	< 5	<5	<5	NA	< 5	<100

Location numbers in parentheses indicate the CH2M HILL or Richard Ellis sample number used during the first sampling event. MW-1, MW-2, and MW-3 are Richard Ellis sample numbers. MW-13 is a CH2M HILL sample number. Other numbers are as designated by Groundwater Management Associates (GMA)

D = Indicates compound level above the calibration limit.

J = Estimated value. Compound detected below the quantitative detection limit

NA = not analyzed

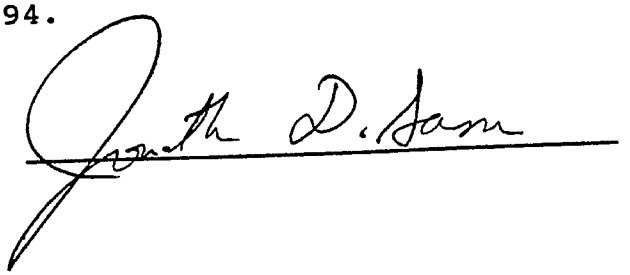
gwdata2.xls

CERTIFICATE OF SERVICE

It is hereby certified that the foregoing AFFIDAVIT OF DOUGLAS G. DRONFIELD has been served this day by depositing copies thereof in a depository under the exclusive care and custody of the United States Postal Service in postage prepaid envelopes and properly addressed as follows:

James F. Hopf, Esq.
Law Offices of Marvin Blount, Jr.
400 West First Street
P.O. Drawer 58
Greenville, North Carolina 27835-0058

This the 1st day of April, 1994.



IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF NORTH CAROLINA
NEW BERN DIVISION

CIVIL ACTION NO. 91-55-CIV-4-H

FILED IN ALL PENDING DUPONT LITIGATION

EDWARD B. GRANT and wife, JANICE C. GRANT,

Plaintiffs,

v.

E.I. DU PONT DE NEMOURS AND COMPANY, INCORPORATED,

Defendant.

AFFIDAVIT OF HENRY J.H. HARRIS

Henry J.H. Harris, being first duly sworn, deposes and says as follows:

1. I am an independent consultant specializing in the planning, management and evaluation of hydrogeologic and geochemical investigations. I obtained my bachelor's degree in philosophy and geology from Haverford College in 1970, and a Ph.D in hydrogeology and hydrogeochemistry from the University of Illinois in 1981. Between 1973 and 1982, I was employed by the Hydrogeology and Geophysics Section of the Illinois State Geological Survey. Before establishing my own firm in 1990, I managed the Earth Sciences and Engineering Department for the consulting firm of CH2M Hill in Reston, Virginia.

2. During my career, I have studied the hydrogeology of numerous industrial facilities and waste disposal sites. Through this work, I have obtained substantial experience in the design, installation and operation of well-fields and groundwater monitoring facilities. In addition, I have expertise in hydrogeologic and geochemical modeling, including the assessment

of contaminant transport. I also have extensive experience in the laboratory analysis of the hydraulic properties of earth materials, and in the design, programming and operation of digital monitoring and control equipment for field and laboratory studies.

3. In addition to my responsibilities as an independent consultant, I teach hydrogeology and computer modeling of groundwater flow in the Whiting School of Engineering at Johns Hopkins University in Baltimore, Maryland. I am also an occasional adjunct professor of hydrogeology and geomorphology at George Mason University in Fairfax County, Virginia. For additional information concerning my background and qualifications, see the curriculam vitae attached hereto as Exhibit 1.

4. I have been retained by the law firm of Moore & Van Allen to provide several opinions concerning the alleged existence of groundwater and surface water contamination at or near the Kentec, Incorporated, parts-washing facility ("the Facility") located on State Road 1802 near Grifton, North Carolina. Specifically, the purpose of this affidavit is to state my opinions concerning: (1) the current nature and extent of groundwater contamination in the Kentec neighborhood; (2) the effectiveness of the groundwater remediation system installed by DuPont at the Facility; and (3) the potential, if any, for future migration of groundwater contamination to the Plaintiffs' properties.

5. In my prior position with CH2M Hill, before 1990, I was directly involved in the investigation of groundwater and surface

water contamination at the Kentec Facility. Through that work, I personally visited the Facility on several occasions.

6. In developing my opinions, I have reviewed the following materials provided to me by Moore & Van Allen: (1) CH2M Hill's written reports from its Groundwater Assessment of the Facility; (2) the Kentec Corrective Action Plan (CAP) dated July 11, 1991; (3) all quarterly groundwater and surface water monitoring results submitted to the State of North Carolina pursuant to the CAP; (4) all water-level measurements taken both on-site and off-site by CH2M Hill; (5) all chemical analyses of groundwater samples taken by CH2M Hill from residential wells in the Kentec neighborhood; (6) the June 11, 1993 and August 13, 1993 affidavits of Dr. Richard K. Spruill, with attachments thereto; (7) the June 9, 1993 affidavit of Dr. Richard A. Ellis, with attachments thereto; and (8) the affidavit prepared by Douglas G. Dronfield in connection with this litigation.

7. Based on my review of the materials listed above, as well as my prior involvement in the investigation of the Facility, I have reached several conclusions regarding the nature and extent of contamination in the Kentec neighborhood. (Exhibit 2 shows my current understanding of the locations of certain significant features of the neighborhood, including the boundaries of the Plaintiffs' properties and the locations of monitoring wells, residential wells, and other sampling points.)

8. There is no evidence that the Peedee Aquifer, which underlies the entire vicinity and is a drinking-water aquifer in this region of North Carolina, is currently contaminated.

Rather, all data show that the contamination is within the shallow, surficial aquifer.

9. There is no evidence that groundwater under nine of the eleven Plaintiffs' properties is now or has ever been contaminated by the Kentec Facility. (The nine properties for which there is no evidence of contamination are those of William and Mary Corbett, Dean Grant, Margie Grant, Roy and Brenda Hughes, Wallace and Edna Jones, Marian Kittle and William Clark, Donnie and Peggy Stancill, Kenneth and Barbara Stancill, and Andy and Tina Taylor, as identified on Exhibit B.) In fact, to the best of my knowledge, monitoring wells (MW-13 and MW-C) have been installed on only one of these properties, that of Andy and Tina Taylor. Groundwater samples from these wells have shown no contamination. In addition, groundwater samples were taken from five residential wells in the neighborhood, on properties owned by William and Mary Corbett, Wallace and Edna Jones, Charles and Linda Braxton, C.L. and Kimberly Braxton, and Ben and Ruby Singleton. Analyses of these samples did not show any contamination.

10. The Ellis Affidavit states that properties owned by Wallace and Edna Jones and Marian Kittle and William Clark are presently contaminated. To the best of my knowledge, there are no sampling studies or analytical data to support that statement. The report attached to the Spruill Affidavit of June 1993 states that the concentration of toluene was elevated in one sample of sediment collected from the bottom of a pond located between the Jones and Kittle/Clark properties. To the best of my knowledge,

however, that pond does not extend onto either the Kittle/Clark or the Jones property.

11. The Spruill Affidavit of June 1993 speculates that the toluene found in the one sediment sample mentioned above may have been released from the Kentec Facility. In my opinion, there is no evidence at all to support this speculation. To the best of my knowledge, toluene has never been found in any groundwater samples taken from wells lying between the pond and the Facility. Furthermore, (as discussed in subsequent paragraphs of my affidavit) there is no evidence at all that groundwater flows from the Facility toward the pond. Consequently, it is extremely unlikely that this toluene originated on the Kentec Facility. Furthermore, toluene is widely and commonly used as a solvent in adhesives and paints and is an additive in many gasolines. The pond in question is bordered by State Road 1802 and by property where I understand that Plaintiff Wallace Jones washed paintbrushes. I believe that it is far more likely that the toluene derives from such activities than from the Kentec Facility.

12. All of the available data show that groundwater beneath the property owned by Robert and Ruth Brooks is not currently contaminated; in addition, the evidence for any past contamination of this property is weak and inconclusive. There are two monitoring wells on the Brooks property, one of which (MW-H) has not shown any groundwater contamination. The Ellis affidavit states that, in June of 1991, a single sample from the other well on the property (MW-F) had traces of two compounds, 1,1-dichloroethene (DCE) and 1,4-dioxane. However, the Ellis

affidavit reports concentrations of these two compounds that are below the normal quantitation limits, meaning that the concentrations were so low that the laboratory was unable to determine how much of either one was actually present in the sample. In my experience, results of this kind are normally viewed with extreme suspicion unless they are confirmed by additional sampling. In fact, the most recent sample from this same well showed no contamination at all. I also note that the only well immediately adjacent to the Brooks property (MW-16, on Kentec property) showed low levels of two compounds during two early sampling events, but has since shown no contamination at all during six separate sampling events, all subsequent to the start-up of the Kentec remediation system.

13. Only one other Plaintiffs' property (that of Bruce and Janice Grant) has shown any groundwater contamination. There are five monitoring wells and one boring location on this property; of these six sampling points, only two (MW-A and MW-G) have shown contamination. All of the data indicate that the concentrations of contaminants in these two wells are at very low levels and that the concentrations have declined since the start-up of the Kentec remediation system. The earliest samples from these wells, taken in July of 1991, were reported by the Plaintiffs to contain 1,4-dioxane at concentrations below the normal quantitation limit. However, 1,4-dioxane was not detected at all in any of the subsequent samples from these two wells, indicating either that the validity of the earlier analyses is doubtful or that the concentrations of 1,4-dioxane have declined to below the detection level in the interim. Samples from both wells

reportedly contained quantifiable amounts of DCE, chloroethane, and 1,1-dichloroethane (DCA) in July of 1991. The concentrations of all three compounds were uniformly lower in the most recent samples from both wells. In particular, DCE was not present in quantifiable amounts in either well; DCA had declined to below the quantitation limit in one well; and chloroethane had declined to below detection limit in the other well. The compound 1,1,1-trichloroethane (TCA) was reportedly found in the most recent sample from MW-A, at a concentration just above the quantitation limit. To the best of my knowledge, this compound has never been found in any other groundwater samples from the neighborhood, including those taken on the Kentec Facility itself.

14. The Spruill Affidavit of June 1993 implies that the groundwater remediation system at Kentec is ineffective. In my opinion, there is no evidence from chemical analyses to support this conclusion. The stated purpose of the remediation system is to effect a reduction of contaminant concentrations to target levels set by the State of North Carolina. In fact (as described above), the concentrations of contaminants on and adjacent to the Bruce and Janice Grant property and the Brooks property have declined since the system went into operation; again, these are the only two Plaintiffs' properties for which there is any evidence of groundwater contamination. Furthermore, since the remediation system went into operation, the concentrations of contaminants have declined dramatically in the two shallow wells (MW-10A and MW-11A) that monitor the boundary between the Facility and the Grant property. In fact, no contamination was found in the most recent samples from these two wells. These

chemical analyses support the conclusion that the remediation system is effective.

15. Paragraph 11 of the Spruill Affidavit of June 1993 states that "there is no evidence of any groundwater flow toward the DuPont facility from adjacent properties such as would be expected from the operation of an effective remedial action system." As noted above, the stated purpose of the Kentec remediation system is to reduce the concentrations of contaminants in groundwater; there is no hydrodynamic performance standard for this system. (A 'hydrodynamic' standard is one that involves the measurement of groundwater levels and/or the determination of directions of groundwater flow.) In fact, the most efficient remediation systems are designed to 'flatten' the groundwater gradient, thereby substantially reducing the rate of movement of contaminants, without imposing large groundwater gradients. Large groundwater gradients (i.e., large differences in water levels between the points of extraction and adjacent points) may indicate that the system is inefficient, removing much more water than is necessary to accomplish the remediation objective. Furthermore, the choice of an appropriate hydrodynamic standard usually requires careful analysis both of the extraction system itself and of its hydrogeologic setting. Occasional water-level measurements from randomly sited wells cannot be used to judge the performance of an extraction system of this kind.

16. As quoted above, the Spruill Affidavit of June 1993 contends that there is no evidence of groundwater flow toward the facility from adjacent properties. There are two equipotential

maps included with a report (by Groundwater Management Associates, or GMA) that is attached to the Spruill Affidavit. I assume that these two maps, together with the associated water-level measurements, are intended to support the contention that groundwater does not flow from adjacent properties toward the Facility. It is my opinion that neither the maps nor the data support this contention. My reasons for this opinion are enumerated in the three paragraphs below. (Please note: DuPont and the Plaintiffs have used different datums for their water-level measurements. Consequently, the absolute value of a DuPont measurement would be several feet below a Plaintiff measurement taken simultaneously at the same location. This difference does not invalidate comparisons of the two sets of data.)

17. In the first place, the GMA Report shows water-level measurements for October 23, 1992 and April 16, 1993, but includes no water-level measurements from within the Kentec Facility itself. Rather, the report appears to <u>assume</u> that the groundwater levels within the Facility on these two dates were like the levels measured within the Facility by CH2M Hill on previous dates. Because these assumed levels were higher than the groundwater levels that GMA measured outside of the Facility, the GMA Report concludes that groundwater flowed away from the Facility on these two dates. However, the complete record of water-level measurements for the neighborhood shows that groundwater levels may vary by as much as two feet in any one well over the course of a year. Furthermore, there have been substantial changes in the management of groundwater within the Kentec Facility during the period in question. For these

reasons, it is incorrect to assume that the groundwater levels within the Facility on October 23, 1992 and April 16, 1993 were like the levels measured on previous dates by CH2M Hill.

18. Secondly, water-level measurements were taken by CH2M Hill on a single day (October 27, 1993) in wells on the Bruce and Janice Grant property and on the Kentec property. The comparison of adjacent wells indicates that, on this date, groundwater levels on the Grant property were uniformly above those on the Kentec property: MW-G (Grant) at 23.50 feet, vs MW-10A (Kentec) at 23.46 feet; MW-A (Grant) at 23.52 feet, vs MW-11A (Kentec) at 23.44 feet. These data clearly do not support the contention that groundwater was flowing away from the Kentec Facility onto the Grant property.

19. Thirdly, GMA reported that, in October of 1992, the groundwater in MW-E (on the Grant property, near the boundary of the Kentec Facility) was at a level of 30.74 feet, while that in MW-D, southeast of MW-E, was at a level of 30.39 feet, suggesting flow away from the Facility. As noted above, this conclusion is not based on measurements within the Kentec Facility; therefore, it applies only to groundwaters beyond the boundaries of the Facility. Furthermore, the same situation clearly did not exist either in April of 1993 or in October of 1993. In April of 1993, GMA reported levels of 32.01 feet in MW-D and 31.88 feet in MW-E. In October of 1993, CH2M Hill measured levels of 23.70 feet in MW-D and 23.51 feet in MW-E. These data clearly do not support the contention that groundwater was flowing away from the Kentec Facility; if anything, they suggest that groundwater was flowing toward the Facility.

20. As noted above, there is no evidence that groundwater beneath the properties of Bill and Mary Corbett and Andrew and Tina Taylor is currently contaminated. In my opinion, it is extremely unlikely that these properties will become contaminated by groundwater travelling through the shallow aquifer from the Kentec Facility. Groundwater flows from these properties toward the Kentec Facility, into the deep ditch which runs along the northwestern boundary of the Facility. The ditch, a tributary of Beaver Dam Branch, currently creates a groundwater divide in the shallow aquifer, serving as a barrier to the migration of contaminants.

21. To the best of my knowledge, there are no monitoring wells or other points at which groundwater levels have been measured in the shallow aquifer to the east of MW-D and MW-G. Consequently, there is no evidence that groundwater in the shallow aquifer flows easterly from the vicinity of MW-D and MW-G. Therefore, it is simply speculation to suggest that Plaintiffs' properties lying to the east of MW-D and MW-G will become contaminated. As mentioned above, there is no evidence that any of these properties (owned by Wallace and Edna Jones, Marian Kittle and William Clark, Donnie and Peggy Stancill, and Kenneth and Barbara Stancill) are now or ever have been contaminated by the Kentec Facility. There is also no evidence that they will become contaminated in the future. In fact, basic principles of hydrogeology suggest that, under natural conditions, the predominant direction of groundwater flow from the vicinity of MW-G and MW-D should be south-southwest (in the

direction of the predominant topographic gradient, toward Beaver Dam Branch), away from these four properties.

22. Even if groundwater were flowing from the Facility toward these properties, there is no evidence that any contaminants in the groundwater would reach these properties in detectable amounts. The concentrations of contaminants dissolved in flowing groundwater are often decreased by dilution, dispersion, and other attenuative mechanisms. The degree of attenuation depends on the characteristics of each contaminant, the aquifer materials, and the groundwater flow system. To the best of my knowledge, there have been no studies of the effects of these mechanisms on or adjacent to the Kentec Facility.

23. As noted above, all of the available hydrodynamic evidence indicates that the Kentec remediation system has flattened the groundwater gradients along the boundary between the Facility and the property of Bruce and Janice Grant. All of the available analytical evidence indicates that the concentrations of contaminants in groundwater on the southern and eastern side of the Facility have declined since start-up of the remediation system. Taken together, these two sets of evidence suggest that the remediation system is effecting a reduction in the concentrations of contaminants on the southern and eastern side of the Facility. If so, the concentrations of contaminants in shallow groundwater beneath the Grant property are likely to continue to drop over time. In these circumstances, even if contaminated groundwater were to leave the Grant property and migrate to other Plaintiffs' properties, the concentrations of

contaminants would probably be below those presently observed on the Grant property, owing to dilution and attenuation.

24. In sum, the only Plaintiffs' property for which there is any evidence of recent groundwater contamination is that owned by Bruce and Janice Grant. In my opinion, the existing data are insufficient to determine with any certainty whether those contaminants will leave the Grant property in the future, where they might travel, or what their concentrations might be.

25. Given the conditions evidenced by the most recent available data, it is very unlikely that groundwater contamination on the Bruce and Janice Grant property and the Facility property will migrate to the properties owned by Bill and Mary Corbett, Wallace and Edna Jones, Marian Kittle and William Clark, Donnie and Peggy Stancill, Kenneth and Barbara Stancill, or Andrew and Tina Taylor. Although it is conceivable that groundwater contamination on the Bruce and Janice Grant property could migrate to properties owned by Robert and Ruth Brooks, Dean Grant, Margie Grant, or Roy and Brenda Hughes, I cannot conclude with any degree of certainty that this migration will occur. Furthermore, even if this migration were to occur, I cannot, with any degree of certainty, conclude that the groundwater beneath these properties would in consequence contain detectable amounts of contamination.

County of Fairfax
State of Virginia

This the 31st day of March, 1994.

Henry J. H. Harris
Henry J.H. Harris

Sworn to and subscribed before me
this 31st day of March, 1994.

Linda S. McCarthy
Notary Public

My Commission Expires:

November 30, 1994

HENRY J. H. HARRIS
Senior Scientist

Education

Ph.D., Hydrogeology and Hydrogeochemistry, University of Illinois, 1981
B.A., Philosophy and Geology, Haverford College, 1970

Expertise

Dr. Harris is an independent consultant specializing in the planning, management, and evaluation of hydrogeologic and geochemical investigations. He performs groundwater resource and well-field design investigations, and is experienced in the planning, installation, and operation of well-fields and groundwater monitoring facilities. He has studied the hydrogeology of numerous industrial facilities and waste disposal sites, including landfills (for hazardous, low-level radioactive, and sanitary wastes), lagoons, and mine spoils and gobs. Dr. Harris provides expert testimony and negotiation support for industry, government, and private organizations.

Dr. Harris is experienced in hydrogeologic and geochemical modeling, including resource evaluation, assessment of contaminant transport, and evaluation of the thermodynamic behavior of solutes. He is experienced in laboratory analysis of the hydraulic properties of earth materials, and in the design, programming, and operation of digital monitoring and control equipment for field studies. He has extensive theoretical and practical knowledge of the inorganic and isotope geochemistry of brines and about the hydrogeochemistry of cold regions.

Dr. Harris currently teaches hydrogeology in the Whiting School of Engineering at Johns Hopkins University, in Baltimore, Maryland. Dr. Harris is an occasional adjunct professor at George Mason University in Fairfax County, Virginia, where he has taught hydrogeology and geomorphology.

Selected Experience

Dr. Harris developed and managed a series of hydrogeologic studies for a Fortune 10 manufacturing company at nine locations in seven states. These studies evolved into lengthy and complex investigations at three sites, involving issues of contaminant transport and water supply. Dr. Harris provided a variety of services during these investigations, ranging from the design of testing protocols in fractured bedrock to extraction well network design.

For a midwestern city that depends entirely on groundwater for water supply, Dr. Harris performed a well-field evaluation. The evaluation included an assessment both of the

performance of recharge facilities crucial to the successful operation of the well fields and of the potential for contamination of the existing supply. In addition, Dr. Harris offered recommendations for the placement, design, and operation of new wells and well fields.

Dr. Harris served as a technical reviewer and consultant for a public interest group concerned about the potential environmental impacts of uranium mining and milling in Virginia. Issues of particular concern were the potential transport of radioactive and other inorganic contaminants by groundwater. The mine and mill facilities were to be situated in an area of fractured and faulted rock in the Piedmont of Virginia.

Dr. Harris served as a senior technical reviewer in a quality assurance program for hazardous waste (Superfund) projects administered by the U.S. Environmental Protection Agency. In this capacity, Dr. Harris reviewed and wrote portions of more than a dozen planning documents for the remedial investigation and closure procedures to be used at hazardous waste sites. He reviewed all or part of several dozen Remedial Investigation and Feasibility Study reports. In addition, Dr. Harris wrote and reviewed protocols for geophysical investigations, monitoring well installation, and groundwater sampling.

Dr. Harris provided technical advice to, and testified in court as an expert witness for, residents of the Virginia Piedmont who were concerned about the impacts of residential development upon groundwater supply in fractured bedrock. In this capacity, Dr. Harris reviewed hydrogeologic reports and gave public testimony before county officials. Dr. Harris also provided technical advice to county officials regarding the development of ordinances to assure the proper testing and development of groundwater supplies.

Dr. Harris managed a series of investigations for the Chesapeake Division of the U.S. Naval Facilities Engineering Command through the Naval Assessment and Control of Installation Pollutants (NACIP) program. Under this program, Dr. Harris directed Confirmation Studies (the Naval equivalent of U.S EPA RI/FS investigations) at six facilities in the coastal plain of Maryland and Virginia. These studies involved the full range of RI/FS activities, from establishment of quality assurance and control programs, to detailed field investigations (including waste sampling, hydrogeologic studies, and surface water studies), to evaluation and recommendation of remedial alternatives. Contamination problems at these facilities ranged from those involving mercury and other heavy metals to subsurface spills and leaks of hydrocarbon fuels.

Dr. Harris is currently providing technical advice and negotiation support to a citizen's group in Fairfax County, Virginia, regarding the impacts of leaks of petroleum compounds which have contaminated the subsurface in residential neighborhoods adjacent to a large tank farm.

HENRY J.H. HARRIS
Senior Scientist

Dr. Harris planned and managed all aspects of an intensive hydrogeologic investigation of a hazardous waste landfill in Maine, where a variety of organic solvents and plasticizers contaminated groundwater in a deep, glacial aquifer. The investigation included geophysical surveys, installation of a complex system of monitoring wells, and sampling and analysis of ground and surface waters for priority pollutants and other dissolved constituents. Dr. Harris compiled and analyzed the data produced by the investigation and wrote an interpretive report assessing the impact of the landfill. With a team of other engineers and scientists, he prepared a feasibility study that compared and evaluated alternative measures to alleviate the adverse impacts of the landfill.

Dr. Harris planned and conducted groundwater contamination assessments for the metals mining industry at four sites in the Northeast and the Midwest. The assessments included installation and sampling of monitoring wells, modeling and interpretation of physical and chemical data, and provision of recommendations for long-term monitoring programs and remedial actions.

As co-investigator in a study funded by the U.S. Nuclear Regulatory Commission, Dr. Harris reviewed cover designs for landfills containing low-level radioactive waste. His work comprised laboratory, field, and computer studies of groundwater flow and contaminant transport in the unsaturated zone. In this capacity, Dr. Harris also designed and supervised the construction of a computerized laboratory instrument used to monitor groundwater flow in variably saturated soils.

Dr. Harris was senior technical consultant for the development of a large groundwater supply for a municipal waste treatment (land application) facility in the coastal plain of New Jersey. Development of the supply included the installation, testing, and evaluation of large production wells.

Dr. Harris managed a remedial investigation of the Chisman Creek Superfund site in York County, Virginia, where flyash had been disposed in pits excavated in the sediments of the coastal plain. Metals found in private wells adjacent to the site were thought to originate in the flyash; in addition, the ash was considered to pose a threat to Chisman Creek, part of which is an estuary tributary to Chesapeake Bay. The investigation comprised geophysical surveys, installation and sampling of monitoring wells, sampling of residential wells and of the Chisman Creek estuary, digital modeling of the geohydrology of the site, and geochemical modeling of inorganic chemical data from the wells. With a team of other engineers and scientists, Dr. Harris prepared a feasibility study that compared and evaluated alternative measures to remediate the pits.

Prior to establishing his own firm in 1990, Dr. Harris managed the Earth Sciences and Engineering Department for CH2M Hill in Reston, Virginia. Dr. Harris was also

HENRY J.H. HARRIS
Senior Scientist

CH2M Hill's coordinator of geohydrologic studies for the northeastern and mid-Atlantic states. In this capacity, he was responsible for the technical quality of CH2M Hill's geohydrologic work, and for the hiring and review of technical staff. Between 1973 and 1982, Dr. Harris was employed in the Hydrogeology Section of the Illinois State Geological Survey.

Prior to his employment with the State of Illinois, Dr. Harris worked for a small consulting firm based in Devon, Pennsylvania, and specialized in environmental impact assessments. He participated in several studies in southeastern Pennsylvania and in central and northern New Jersey. He studied water supply in northern New Jersey and wrote the geologic sections of four environmental studies involving the Cretaceous and Quaternary sediments of the coastal plain.

Membership in Professional Organizations

American Geophysical Union
Association of Groundwater Scientists and Engineers

References

Available upon request.

HENRY J.H. HARRIS
Senior Scientist

Publications and Presentations

Dr. Harris has written or coauthored 19 journal articles and abstracts, some of which are cited below:

"A Gamma Ray Attenuation System for Studying the Movement of Moisture in Model Landfill Covers." American Geophysical Union, Annual Meeting, Philadelphia, Pennsylvania. 1982.

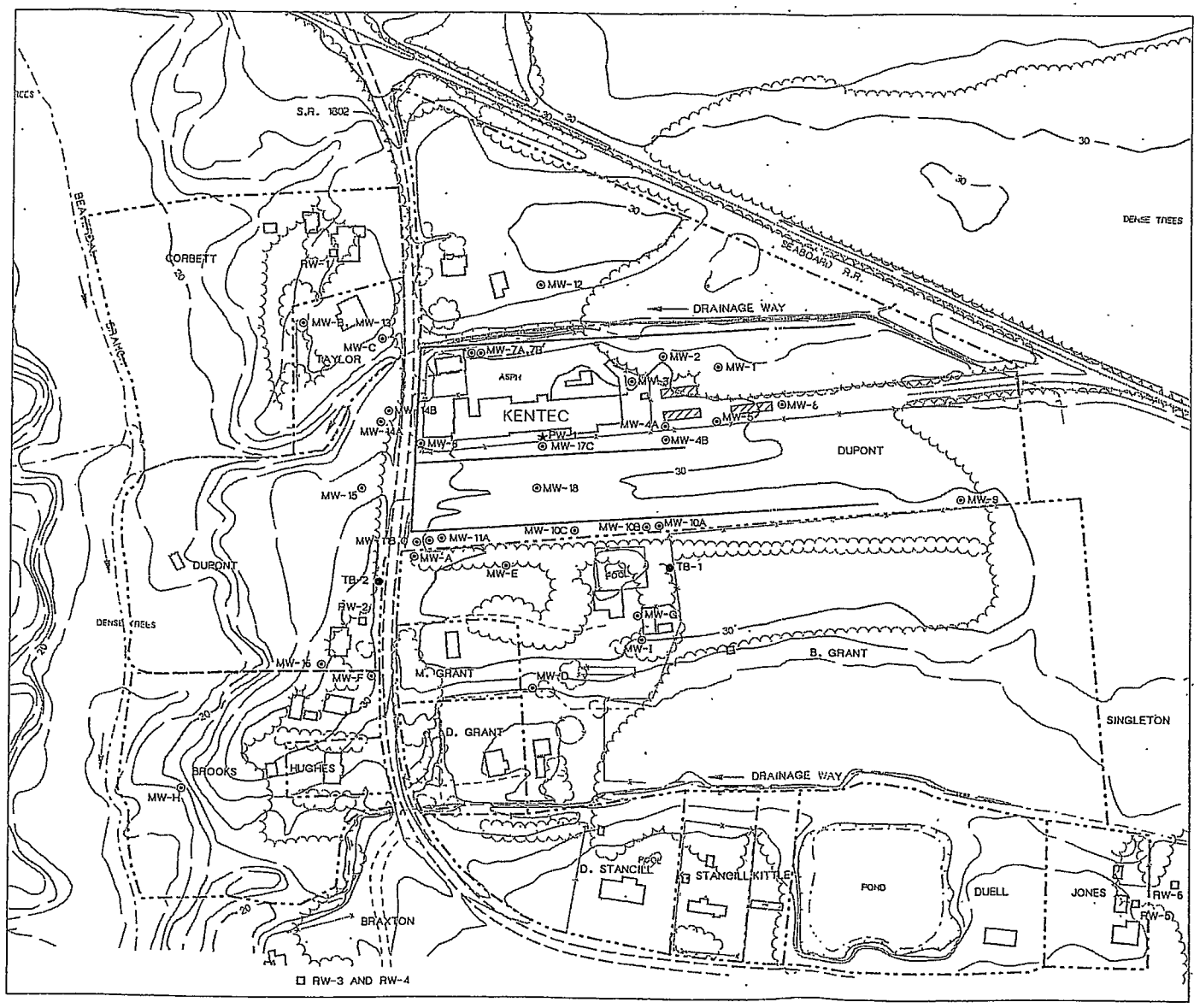
With K. Cartwright. "Pressure Fluctuations in an Antarctic Aquifer: The Freight-Train Response to a Moving Rock Glacier." Antarctic Geoscience. Madison, Wisconsin: University of Wisconsin Press. 1982.

With K. Cartwright. "Hydrogeology of the Dry Valley Region, Antarctica." Antarctic Research Series, Vol. 33, American Geophysical Union, Washington, D.C. 1982.

With K. Cartwright, B.L. Herzog, and T.M. Johnson. A Study of Trench Covers to Minimize Infiltration at Waste Disposal Sites. Nuclear Regulatory Commission, Washington, D.C. NUREG/CR-2478. 1981.

"Hydrogeochemical Processes in the Active Layer of Some Antarctic Soils." Proceedings of the Third Colloquium on Planetary Water. Planetary Geology Program, NASA, Washington, D.C. 1980.

With K. Cartwright and T. Torii. "Dynamic Chemical Equilibrium in a Polar Desert Pond: A Sensitive Index of Meteorological Cycles." Science 204 (4390) and 204 (4396). 1979.



LEGEND

- COLLECTION TRENCH LOCATION
- MONITORING WELL
- RESIDENTIAL WELL
- PRODUCTION WELL
- TEMPORARY BORING
- PROPERTY BOUNDARY

NOTE: BASE MAP COMPILED FROM AERIAL PHOTOGRAPHY FLOWN ON 2/10/89. PROPERTY BOUNDARIES ARE ESTIMATED.

0 100 200 300

SCALE: 1"=200'

Exhibit 2

WELL LOCATIONS AND PROPERTY BOUNDARIES Du Pont Kentec Facility

6629ex07.dgn 21-oct-1993

CERTIFICATE OF SERVICE

It is hereby certified that the foregoing AFFIDAVIT OF HENRY J.H. HARRIS has been served this day by depositing copies thereof in a depository under the exclusive care and custody of the United States Postal Service in postage prepaid envelopes and properly addressed as follows:

James F. Hopf, Esq.
Law Offices of Marvin Blount, Jr.
400 West First Street
P.O. Drawer 58
Greenville, North Carolina 27835-0058

This the 15th day of April, 1994.

Jonathan D. Jasser

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF NORTH CAROLINA
NEW BERN DIVISION

CIVIL ACTION NO. 91-55-CIV-4-H

FILED IN ALL PENDING DUPONT LITIGATION

EDWARD B. GRANT and wife, JANICE C. GRANT,

Plaintiffs,

v.

E.I. DU PONT DE NEMOURS AND COMPANY, INCORPORATED,

Defendant.

AFFIDAVIT OF JAY VANDEVEN

Jay Vandeven, being duly sworn, deposes and says as follows:

1. I am a senior environmental engineer and project manager at the consulting firm of CH2M HILL in Reston, Virginia, where I have been employed since 1986. Before joining CH2M HILL, I received a bachelor's degree in civil engineering from Clemson University in 1982, and a master's degree in environmental engineering from Clemson University in 1985. A more complete statement of my professional qualifications is set forth in my curriculum vitae, which is attached hereto as Exhibit 1.

2. I have been retained by the law firm of Moore and Van Allen to provide a review of my involvement at the Kentec facility (the "Facility") and to offer my opinions regarding the source of contamination at the Facility and the effectiveness of the groundwater remediation system.

3. CH2M HILL is a multi-disciplinary consulting firm which provides a wide range of technical services, principally for industrial, municipal, and federal clients. CH2M HILL's principal areas of professional service include the investigation and remediation of environmental contamination, the study and design of water and wastewater treatment systems, environmental management, and regulatory compliance. To provide these services, CH2M HILL retains, among other specialists, individuals with technical expertise in environmental engineering, geology, hydrogeology, waste treatment, and toxicology.

4. CH2M HILL provides consulting services in the areas of investigation and remediation of environmental contamination at both operating industrial facilities and abandoned sites. At such facilities and sites, CH2M HILL routinely provides technical support and advice on the nature and extent of environmental contamination, human health and environmental risks posed by the site, establishment of cleanup levels, selection of appropriate remediation technologies, design of remediation systems, and oversight of remedial construction activities.

5. As part of these facility and site evaluations, CH2M HILL conducts risk assessments to assist clients in assessing the potential for harm to human and ecological populations as a result of chemical releases. These risk assessments are performed by toxicologists, health scientists, and biologists who analyze data related to a release, identify chemicals of concern, identify exposure pathways to receptor populations, calculate exposure doses for those populations, and, based upon the

toxicological profiles for the chemicals of concern, assess the risk of present or future harm to the receptor populations.

6. As an environmental engineer and project manager, the majority of my work focuses on the planning and execution of projects involving the investigation and remediation of environmental contamination of groundwater, surface water, and soils. I have extensive experience in the investigation and treatment of a wide variety of chemical substances, including chlorinated hydrocarbons, petroleum derived compounds, and other organic compounds. Most of the projects I have been involved with include determining the nature and extent of groundwater contamination, developing and evaluating alternatives for remediation, designing remediation systems, and overseeing remediation construction activities.

7. I also have substantial professional experience in conducting environmental audits of industrial facilities. These audits involve determining the potential sources of environmental releases and contamination through knowledge and evaluation of the industrial processes at the facility.

8. I have planned, performed, and supervised the following groundwater investigation and remediation activities: groundwater sampling and analysis, determination of the vertical and horizontal extent of contaminant plumes, determination of the direction and rate of groundwater flow, estimation of the fate and transport of contaminants in groundwater systems, comparative evaluation of remediation alternatives, detailed design of groundwater remediation systems, and oversight of remediation construction activities.

9. I have supervised or assisted on groundwater contamination and remediation projects in North Carolina since 1990. Through these projects, I have had substantial interaction with officials of the North Carolina Division of Environmental Management ("DEM"), which administers the State groundwater quality program and other water quality protection programs.

10. My involvement at the Facility began in mid-1990 during the Phase 3 Groundwater Assessment. On July 23, 1990, I conducted a facility audit to (1) identify potential sources of groundwater contamination from existing and past operations and (2) identify sampling strategies and investigation methods that could be used to confirm and quantify potential contaminant sources. The facility audit included interviews with Kentec personnel, review of available process data, and an exhaustive inspection of the Facility.

11. During the facility audit, I identified several potential sources of groundwater contamination, and concluded that additional sampling should be performed regarding each such potential source. I set forth the results of the facility audit in a Technical Memorandum dated September 4, 1990. After further sampling of potential sources at the Facility in September 1990, I prepared an October 23, 1990 Technical Memorandum summarizing the results.

12. As a result of the facility audit and the subsequent sampling, I recommended several corrective actions. My recommendations, which were carried out by DuPont in late 1990 and early 1991, included (1) the removal of three underground tanks, (2) installation of a fiberglass sleeve in the rinse water

wet well, (3) replacement of cracked sections in the rinse water process line, and (4) cleaning and sealing of all dike and process area floors. I personally supervised the removal of the underground tanks and the subsequent sampling.

13. During the spring of 1991, I initiated the development of a Corrective Action Plan (CAP) for remediation of groundwater at the Facility. Throughout the development of the CAP, I accompanied DuPont representatives in visits to the DEM offices. Through these visits, the scope and technical approach to the remediation system at the Facility was explained and discussed. DuPont submitted the CAP to the North Carolina DEM July 11, 1991, which approved it on August 20, 1991.

14. The CAP was developed to meet the requirements of the DEM's "Outline for Evaluation of Site Characterization Data and Remedial Action Plans for Groundwater Restoration". The specific objectives of the corrective action, as stated in the CAP, were to (1) prevent further migration of contaminants within the Facility boundary, (2) remove and treat the contaminants to the established cleanup levels, and (3) achieve a timely cleanup.

15. The chemical substances identified and addressed in the CAP were 1,4-dioxane, 1,1-dichloroethane (DCA), and 1,1-dichloroethene (DCE). The target cleanup levels for these compounds were determined by the then current North Carolina Administrative Code Title 15A Subchapter 2L - Classification and Water Quality Standards Applicable to the Groundwaters of North Carolina (dated December 1, 1989). These regulations established a cleanup standard of 7 parts per billion (ppb) for DCE. Because DCA did not have a Subchapter 2L standard, its target

cleanup level was also set at 7 ppb. It is noted that the DEM established, subsequent to the implementation of the groundwater remediation system, a 2L water quality standard of 700 ppb for DCA (revised standards published November 8, 1993). DuPont has chosen to continue to meet the more stringent 7 ppb target cleanup level for DCA.

16. The regulations contain a water quality standard for 1,4-dioxane of 7 ppb. The regulations also state that "where the maximum allowable concentration of a substance is less than the limit of detectibility, the substance shall not be permitted in detectable concentrations." The limit of detectibility is defined in the regulations as "the method detection limit established for the U.S. EPA approved test procedure providing the lowest method detection limit for the substance being monitored." The only EPA approved procedure was contained in 40 CFR Part 264 and specifies EPA Method 8015 for the analysis of 1,4-dioxane. The practical quantification limit associated with this procedure is 150 ppb. Therefore, the DEM approved a cleanup level of 150 ppb for 1,4-dioxane.

17. Because the surficial aquifer at the Facility is thin and the underlying silt layer is within fifteen feet of the ground's surface, the CAP recommended an interceptor trench for collection of groundwater. The interceptor trench consists of perforated pipe surrounded by permeable, granulated backfill. The trench was designed and constructed with the pipe below the silt layer, therefore preventing groundwater from the surficial aquifer from flowing across the trench beneath the pipe.

18. While designing the interceptor trench, CH2M HILL also conducted a treatability study to investigate various methods of treating the collected groundwater. Because of the varying properties of 1,4-dioxane, DCE, and DCA, we concluded that chemical oxidation was the most viable method for treating the groundwater.

19. The remediation system was installed at the Facility in late 1991 and early 1992. I assisted in the design and construction oversight of the system. The system went on-line in August of 1992.

20. CH2M HILL has assisted in providing quarterly monitoring reports to the North Carolina DEM since the remediation system began operating. The reported data has included the levels of 1,4-dioxane, DCA and DCE in all monitoring wells and surface water samples, the levels of those compounds in the effluent from the treatment system, and the water elevations in all monitoring wells.

21. Since start-up of the system, over 4 million gallons of contaminated groundwater have been removed from beneath the Facility. The treatment system has been highly effective in treating contaminated groundwater. Chemical substance concentrations discharged from the treatment system have always met the DEM-established cleanup levels.

22. I have reviewed materials prepared by experts retained by the Plaintiffs, with a focus on their opinions regarding the nature and source of chemical substances at the Facility and the operation and effectiveness of the groundwater remediation system. I have reviewed two affidavits executed by Dr. Richard

Spruill on June 11, 1993, and August 13, 1993, and the materials attached thereto. I have also reviewed an affidavit signed by Dr. Richard A. Ellis on June 9, 1993, along with the attachments to that affidavit. In addition, I attended the deposition of Dr. Ellis, and reviewed portions of the written transcripts for the depositions of Dr. Ellis and Dr. Spruill. I have also reviewed the affidavit of Douglas Dronfield of CH2M HILL.

23. I have reached opinions regarding several of the assertions contained in Dr. Ellis' deposition, primarily regarding the nature and extent of contamination and the effectiveness of the remediation.

24. Dr. Ellis makes several broad assertions that all chemical substances found in all groundwater samples were of DuPont origin. He does so apparently without any detailed information regarding the chemicals, or the industrial process, employed at the Facility. In fact, he expressly assumes and concludes that all chemical substances detected were used at the Facility because they are not naturally occurring. Thoughtful and scientifically-based conclusions regarding the nature and source of chemical substances in the environment are not appropriately formed through mere assumption. Rather, one must consider and evaluate, to the fullest extent possible, the specific chemicals and processes that have, or may have, been employed at a facility as well as other non-facility-related sources. Such an evaluation would generally be supplemented with a review of discharge, release, and disposal practices at the facility. Through such a measured and logical process, the origin of chemical substances detected in the environment can

often be ascertained and potentially linked with a source. I have seen no evidence that such an evaluation has been performed by the plaintiff's experts.

25. Based on the three phases of groundwater assessment and the Facility audit, it is my opinion that indeed 1,4-dioxane, DCE, and DCA are of DuPont origin. However, there is no evidence that TCE, carbon disulfide, toluene, 1,4-dichlorobenzene, methyl ethyl ketone, vinyl chloride, and xylenes (chemical substances that Dr. Ellis specifically attributes to Kentec) are of DuPont origin.

26. Dr. Ellis states that free-product TCE possibly exists at the Facility. This assertion is clearly unsupported by the data. No TCE has ever been detected in the groundwater at the site; nor is there any evidence that TCE was used there.

27. Dr. Ellis also asserts that the remediation system is ineffective because it is not pulling back contamination from off the Facility. This represents a fundamental misunderstanding of the objectives and operation of the interceptor trenches. As stated in the CAP, and approved by the DEM, the purpose of the trench is not to pull back contamination, but to prevent further migration off site. Chemical data from wells between the Facility and the Plaintiffs' property (10A and 11A) clearly demonstrates that this objective is being achieved. Dr. Ellis also states that the trench is not effective because "groundwater is going to go under this pipe." The pipe in the interceptor trench was specifically designed to be located beneath the surficial aquifer and, therefore, groundwater flow beneath the pipe in the surficial aquifer is not physically possible.

28. Dr. Ellis further demonstrates his lack of knowledge concerning the treatment system through his statement that a carbon filter is used to treat contaminated water collected in the trench. In fact, the treatment system, which is discussed in detail in the CAP, and which has been in operation for 18 months, is one of chemical oxidation. No carbon filter has ever been used to treat groundwater at the Facility.

29. Furthermore, Dr. Ellis believes, based on his deposition, that treated groundwater is being discharged to a surface stream at the site. In fact, ever since the start-up of the treatment system in August 1992, treated groundwater has been transported off site for disposal. No treated groundwater from the remediation system has ever been discharged to a surficial stream at the Facility.

30. Based on the above, Dr. Ellis' deposition contains serious errors regarding the most fundamental elements of the groundwater remediation system. Therefore, the conclusions and opinions he has reached on this subject are, at best, irrelevant to the operating groundwater remediation system at the Facility.

31. Dr. Spruill's affidavit, dated August 13, 1993, contains several opinions and quantitative estimates concerning the costs of cleaning up contamination on the properties of Bruce and Janice Grant, Robert Brooks, and Andy Taylor. As stated in the affidavit of Douglas Dronfield, the only property currently contaminated with chemical substances is that of Bruce and Janice Grant. There is no evidence of current groundwater contamination on the properties of Robert and Ruth Brooks, Andy and Tina Taylor, William and Mary Corbett, Dean Grant, Margie Grant, Roy

and Brenda Hughes, Wallace and Edna Jones, Marian Kittle and William Clark, Donnie and Peggy Stancill, or Kenneth and Barbara Stancill. I fully agree with the opinions of Mr. Dronfield on this subject. Because these properties are not contaminated, no groundwater remediation would be required by the DEM. Therefore, no costs would be incurred associated with such remediation.

32. The concentration of chemical substances on the property of Edward and Janice Grant has been declining, based on samples taken by the Plaintiffs' consultants in June 1991, December 1992, and April 1993. Furthermore, no chemical substance is currently present on the Grant Property in concentrations exceeding the North Carolina DEM's 2L groundwater standards.

33. Based on the foregoing, my experience in determining the need and scope of groundwater remediation systems, and my experience in negotiating with the North Carolina DEM, it is extremely unlikely that the DEM would require active groundwater remediation of the Grant property. Therefore, no costs would be incurred associated with such remediation.

County of Fairfax
State of Virginia

This the 30 day of MARCH, 1994

Jay Vandeven
Jay Vandeven

Sworn to and subscribed before me
this 30th day of March, 1994.

Linda S. McCarthy
Notary Public

My Commission Expires:

November 30, 1994

JAY VANDEVEN

EXPERTISE

Mr. Vandeven is an environmental engineer at CH2M HILL. He has ten years of management and technical experience in contaminated site assessments and remediation. Prior to joining CH2M HILL, Mr. Vandeven was employed by ENVIRON Corporation.

Mr. Vandeven's areas of technical competence include the assessment of the nature and extent of chemical contamination in the environment, contaminant hydrogeology, and environmental remediation. He has performed substantive work in these areas at over 30 sites throughout the United States and internationally. Mr. Vandeven's clients have included the federal EPA, Department of Defense, and private industry.

EDUCATION

Master of Science in Environmental Engineering	Clemson University	1985
Bachelor of Science in Civil Engineering	Clemson University	1982

AFFILIATIONS

Air and Waste Management Association
American Chemical Society
Association of Groundwater Scientists and Engineers
Water Environment Federation

SELECTED EXPERIENCE

Program Manager - Industrial Site Remediation (Current)

Subject investigation and remediation is the largest project of its kind conducted by the CH2M HILL Reston office. The project has included all phases of environmental investigation, feasibility studies, remedial design, and construction. Distinguishing features of the project include: installation and monitoring of over 100 groundwater wells within a highly complex hydrogeological flow system; measurement and fate and transport determinations of specialty chemicals within all environmental media; development and implementation of an advanced groundwater model to predict contaminant migration and extraction system performance; installation of a fifty-well groundwater extraction system.

Operations Manager - Superfund EPA Region 3 (Current)

Superfund Region 3 contract represents work at approximately 40 National Priority List sites. Work at these sites include investigations of dissolved and DNAPL contamination, comprehensive human health and environmental risk assessments, feasibility studies, remedial designs, and remedial action oversight. Responsible for developing project scopes, budget, and staffing. Provide senior review for work plans and technical work products.

Project Manager - Industrial Site Remediation (Current)

Conducted investigation and remediation of organic groundwater contamination at an industrial facility. Developed, designed, and constructed an approximate 2000-ft interceptor trench and advanced chemical oxidation system to collect and treat contamination.

Project Manager - Patuxent River Naval Air Station Remediation (1988-1993)

Project manager for five year investigation and remediation at a thirty-acre fuel farm at the Patuxent River Naval Air Station in Maryland. Delineated contamination that included both dissolved and free-phase petroleum contamination resulting from storage tanks with a volume of over 1 million gallons. Managed the design and provided oversight for the construction of a three-million dollar collection and treatment system. System components included a 2000-ft collection trench, phase separation, air stripping, carbon adsorption, and biological degradation of contaminated soils.

Czechoslovakia Feasibility Study (1991-1992)

Part of four person team that conducted one of the first hazardous waste site remediation studies in Czechoslovakia. Project was funded by the Trade and Development Program and included the development of a comprehensive feasibility study one of the preeminent hazardous waste sites in the country. This was the first application of the U.S.-based

approach for conducting environmental investigations, risk assessments, and engineering feasibility studies to be applied in eastern Europe. Work was conducted in Czechoslovakia in association with a local engineering firm.

Project Manager - Various Superfund Sites Nationwide (1987-1991)

Project manager for five Superfund sites located throughout the country. Maintained technical and financial responsibility for large sites with fees over $500,000. Sites include Vertac (Arkansas), United Nuclear Corporation (New Mexico), Boarhead Farms (Pennsylvania), L.A. Clarke Wood Preserving (Virginia), and North Penn (Pennsylvania). In total, have had substantive involvement at more than twenty-five Superfund sites.

Litigation Consultant - Hardage Superfund Site (1990-1991)

Provided litigation support to the Department of Justice in the Hardage Superfund case. Assisted in the development of the government's remedy for the site and counseled on the deposition and trial strategy. Provided remedy design testimony to the court.

Environmental Auditing - Various Industrial Clients (1987-1992)

Have conducted comprehensive environmental management audits at numerous industrial facilities. Key clients include: DuPont Kinston Plant, North Carolina; Hercules Ballistic Laboratory, West Virginia; and CIL Agribusiness, Canada.

OTHER PROFESSIONAL ACTIVITIES

WASTECH STEERING GROUP MEMBER

Represent the Hazardous Waste Action Coalition on the steering committee of WASTECH. WASTECH is a group created by the American Academy of Environmental Engineers to develop peer-reviewed, state-of-the-practice documents on innovative hazardous waste treatment technologies. Members of the steering committee include member of industry, the heads of EPA ORD and Science Advisory Board, and national recognized academicians.

Lecturer - Executive Enterprises

Developed and conducted lectures on innovative solutions to hazardous waste remediation. Lectures were given as part of Executive Enterprises annual lecture series.

Professional Publications

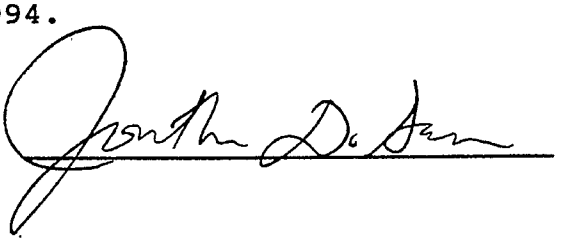
Publication list available upon request.

CERTIFICATE OF SERVICE

It is hereby certified that the foregoing AFFIDAVIT OF JAY VANDEVEN has been served this day by depositing copies thereof in a depository under the exclusive care and custody of the United States Postal Service in postage prepaid envelopes and properly addressed as follows:

James F. Hopf, Esq.
Law Offices of Marvin Blount, Jr.
400 West First Street
P.O. Drawer 58
Greenville, North Carolina 27835-0058

This the 1st day of April, 1994.



R-12003-K REV. 8-90

January 1994 sampling event

DU PONT
REG US PAT & TM OFF
ESTABLISHED 1802

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
KINSTON PLANT
P.O. BOX 800
KINSTON, NORTH CAROLINA 28502-0800
PHONE (919) 522-6111

FIBERS DEPARTMENT

February 21, 1994

Mr. Willie A. Hardison
Div. of Environmental Management
Groundwater Section
P. O. Box 1507
Washington, NC 27889

Subject: Permit No. WQ0005906
E. I. du Pont de Nemours & Co. Inc.
Kentec Site, SIC Code No. 7399
Groundwater Remediation System
Lenoir County

Dear Mr. Hardison:

Pursuant to the requirements of the subject permit, here are the data for the specified time frames. If there are any questions, please give me a call on (919) 522-6263.

Also enclosed is a "Water-Level Elevations" chart for October 28, 1993, which has been revised to correct a transposing error. The change is minor and we regret it occurred. Please use this revised page to replace the subject page in our report submitted to you on January 3, 1994.

Sincerely,

J. D. Henderson/jkj

J. D. Henderson, Manager
N.C. Environmental Affairs

JDH/jkj
Attachments

CH2M HILL

MEMORANDUM

TO: Jerry Henderson/ Du Pont

FROM: Doug Dronfield/ CH2M HILL

DATE: February 15, 1994

SUBJECT: Kentec Quarterly Groundwater Data and Monthly Railcar Data

Enclosed are the quarterly groundwater monitoring data results (November, 1993 through January, 1994), the railcar concentrations, and monthly railcar average concentrations for the same time period (November, 1993 through January, 1994). The submittal of this data to the state complies with Section II.2. of the June 17, 1992 Groundwater Remediation Permit.

The railcar data (effluent from the groundwater treatment plant) are well within the limits established by in the permit (Section I.27).

Kentec Quarterly Groundwater Data
January, 1994
All Concentrations are PPB

Well Number	Date	1,1-Dichloro-ethene	1,1-Dichloro-ethane	1,4-Dioxane
MW-1	Jan-94	< 7	< 7	< 150
MW-3	Jan-94	46	14	370
MW-4A	Jan-94	< 7	< 7	1000
MW-4B	Jan-94	< 7	< 7	< 150
MW-6	Jan-94	< 7	< 7	5700
MW-7A	Jan-94	< 7	< 7	460
MW-7B	Jan-94	< 7	< 7	< 150
MW-8	Jan-94	< 7	< 7	< 150
MW-9	Jan-94	< 7	< 7	< 150
MW-10A	Jan-94	< 7	< 7	< 150
MW-10B	Jan-94	< 7	< 7	< 150
MW-11A	Jan-94	< 7	< 7	< 150
WM-11B	Jan-94	< 7	< 7	< 150
MW-12	Jan-94	< 7	< 7	< 150
MW-14A	Jan-94	< 7	8.8	350
MW-14B	Jan-94	< 7	< 7	< 150
MW-15	Jan-94	< 7	8.7	< 150
MW-16	Jan-94	< 7	< 7	< 150
MW-18	Jan-94	< 7	< 7	< 150
SW-11	Jan-94	< 7	< 7	< 150
SW-24	Jan-94	< 7	< 7	< 150
PS-2	Jan-94	< 7	8.6	< 150

Kentec Groundwater Treatment Facility
November,1993 - January,1994
Railcar

Identification Code	Date	Time	DCE (ppb)	DCA (ppb)	1,4 Dioxane (ppb)
	November				
Railcar 94041	1	800	5	<5	<100
Railcar 34064	2	730	<5	<5	<100
Railcar 94041	4	800	<5	<5	<100
Railcar 34064	8	730	<5	<5	<100
Railcar 94041	10	800	<5	<5	<100
Railcar 34064	12	800	<5	<5	<100
Railcar 94041	15	800	<5	<5	<100
Railcar 34064	17	730	<5	10	<100
Railcar 94041	19	800	<5	9	<100
Railcar 34064	22	730	<5	9	<100
Railcar 94041	24	730	<5	8	<100
Railcar 34064	29	730	<5	<5	<100
Railcar 94041	30	730	<5	<5	<100
Monthly Average			5	6.2	<100
	December				
Railcar 34064	3	730	2	1	<100
Railcar 94041	6	730	<5	<5	<100
Railcar 34064	8	800	9	<5	<100
Railcar 94041	10	730	<5	<5	<100
Railcar 34064	13	730	<5	<5	<100
Railcar 94041	15	730	<5	<5	<100
Railcar 34064	17	730	<5	<5	<100
Railcar 94041	20	730	<5	<5	<100
Railcar 34064	22	730	<5	5	112
Railcar 94041	27	800	<5	<5	<100
Railcar 34064	30	730	<5	9	<100
Monthly Average			5.09	5	101.09
	January				
Railcar 94041	3	730	<5	<5	<100
Railcar 34064	5	800	<5	5	<100
Railcar 94041	7	730	<5	<5	<100
Railcar 34064	10	730	13	<5	<100
Railcar 94041	12	730	<5	<5	<100
Railcar 34064	14	730	<5	<5	<100
Railcar 94041	18	700	<5	<5	<100
Railcar 34064	21	700	<5	<5	<100
Railcar 94041	24	730	<5	5	<100
Railcar 34064	25	700	<5	<5	<100
Railcar 94041	27	700	<5	<5	<100
Railcar 34064	31	730	<5	<5	<100
Monthly Average			5.66	5	<100

Kentec Groundwater Data
Water-Level Elevations
January 12, 1994
(Feet Above Mean Sea Level)

Monitoring Well Number	Groundwater/ Surface Water Elevation
MW-1	25.12
MW-3	22.79
MW-4A	25.02
MW-4B	22.68
MW-6	23.91
MW-7A	24.45
MW-7B	22.85
MW-8	25.00
MW-9	25.16
MW-10A	24.93
MW-10B	21.83
MW-11A	24.75
MW-11B	22.26
MW-12	25.30
MW-14A	22.14
MW-14B	22.63
MW-15	23.33
MW-16	24.38
MW-18	24.38

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Kentec Groundwater Data
Water-Level Elevations
October 28, 1993
(Feet Above Mean Sea Level)

Monitoring Well Number	Groundwater/ Surface Water Elevation
MW-1	23.89
MW-3	24.07
MW-4A	23.69
MW-4B	21.28
MW-6	23.24
MW-7A	24.46
MW-7B	21.40
MW-8	23.60
MW-9	23.28
MW-10A	23.50
MW-10B	20.39
MW-11A	23.47
MW-11B	20.86
MW-12	25.08
MW-14A	22.31
MW-14B	21.25
MW-15	22.18
MW-16	23.36
MW-18	23.65

gwelv.xls

R-12003-K REV. 8-90

DU PONT
REG US PAT & TM OFF
ESTABLISHED 1802

October 1993 sampling event

RECEIVED
WASHINGTON OFFICE
JAN 0 6 1994
D. E. M.

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
KINSTON PLANT
P.O. BOX 800
KINSTON, NORTH CAROLINA 28502-0800
PHONE (919) 522-6111

FIBERS DEPARTMENT

January 3, 1994

Mr. Willie A. Hardison
Div. of Environmental Management
Groundwater Section
P. O. Box 1507
Washington, NC 27889

Subject: Permit No. WQ0005906
E. I. du Pont de Nemours & Co. Inc.
Kentec Site, SIC Code No. 7399
Groundwater Remediation System
Lenoir County

Dear Mr. Hardison:

Pursuant to the requirements of the subject permit, here are the data for the specified time frames. If there are any questions, please give me a call on (919) 522-6263.

Sincerely,

J. D. Henderson, Manager
N.C. Environmental Affairs

JDH/jkj
Attachments

Please Brief me
Hank

CH2MHILL

RECEIVED
WASHINGTON OFFICE

JAN 0 6 1994

D. E. M.

MEMORANDUM

TO: Jerry Henderson/ Du Pont

FROM: Doug Dronfield/ CH2M HILL

DATE: December 22, 1993

SUBJECT: Kentec Quarterly Groundwater Data and Monthly Railcar Data

Enclosed are the quarterly groundwater monitoring data results (August through October, 1993), the railcar concentrations, and monthly railcar average concentrations for the same time period (August through October, 1993). The submittal of this data to the state complies with Section II.2. of the June 17, 1992 Groundwater Remediation Permit.

The railcar data (effluent from the groundwater treatment plant) are well within the limits established by in the permit (Section I.27).

Kentec Groundwater Treatment Facility
August - October, 1993
Railcar

Identification Code	Date	Time	DCE (ppb)	DCA (ppb)	1,4 Dioxane (ppb)
	August				
Railcar 94041	2	730	<5	5	<100
Railcar 34064	5	730	<5	<5	<100
Railcar 94041	9	730	<5	<5	<100
Railcar 34064	12	800	<5	<5	<100
Railcar 94041	16	730	<5	<5	<100
Railcar 34064	19	730	<5	<5	<100
Railcar 94041	23	730	<5	<5	<100
Railcar 34064	25	730	<5	<5	<100
Railcar 94041	30	700	<5	5	<100
Monthly Average			<5	5	<100
	September				
Railcar 34064	2	700	<5	<5	<100
Railcar 94041	7	800	<5	<5	<100
Railcar 34064	10	800	13	7	<100
Railcar 94041	13	730	<5	<5	<100
Railcar 34064	15	700	<5	<5	<100
Railcar 94041	20	730	17	<5	<100
Monthly Average			8.3	5.3	<100
	October				
Railcar 34064	1	730	<5	<5	<100
Railcar 94041	4	800	<5	<5	<100
Railcar 34064	8	800	<5	<5	<100
Railcar 94041	11	800	<5	<5	<100
Railcar 34064	13	800	<5	<5	<100
Railcar 94041	15	800	<5	<5	<100
Railcar 34064	18	800	<5	<5	<100
Railcar 94041	21	730	<5	<5	<100
Railcar 34064	25	730	<5	<5	<100
Railcar 94041	26	800	6	<5	<100
Railcar 34064	29	730	<5	<5	<100
Monthly Average			5.09	<5	<100

Kentec Quarterly Groundwater Data
October, 1993
All Concentrations are PPB

Well Number	Date	1,1-Dichloro-ethene	1,1-Dichloro-ethane	1,4-Dioxane
MW-1	Oct-93	< 7	< 7	330
MW-3	Oct-93	61	74	500
MW-4A	Oct-93	8.6	17	1800
MW-4B	Oct-93	< 7	< 7	< 150
MW-6	Oct-93	< 7	< 7	9200
MW-7A	Oct-93	7.2	< 7	650
MW-7B	Oct-93	<7	< 7	< 150
MW-8	Oct-93	<7	14	220
MW-9	Oct-93	< 7	< 7	< 150
MW-10A	Oct-93	< 7	8.1	< 150
MW-10B	Oct-93	< 7	< 7	< 150
MW-11A	Oct-93	< 7	< 7	< 150
MW-11B	Oct-93	< 7	< 7	< 150
MW-12	Oct-93	< 7	< 7	< 150
MW-14A	Oct-93	< 7	< 7	650
MW-14B	Oct-93	< 7	< 7	< 150
MW-15	Oct-93	11	73	< 150
MW-16	Oct-93	< 7	< 7	< 150
MW-18	Oct-93	< 7	< 7	< 150
SW-11	Oct-93	< 7	< 7	< 150
SW-24	Oct-93	< 7	< 7	< 150
PS-2	Oct-93	<50	150	< 150

Kentec Groundwater Data
Water-Level Elevations
October 28, 1993
(Feet Above Mean Sea Level)

Monitoring Well Number	Groundwater/ Surface Water Elevation
MW-1	23.88
MW-3	24.07
MW-4A	23.69
MW-4B	21.28
MW-6	23.24
MW-7A	24.46
MW-7B	21.40
MW-8	23.60
MW-9	23.45
MW-10A	23.50
MW-10B	20.39
MW-11A	23.47
MW-11B	20.86
MW-12	25.08
MW-14A	22.31
MW-14B	21.25
MW-15	22.18
MW-16	23.36
MW-18	23.21

EXTERNAL AFFAIRS
150 Fayetteville Street Mall, Suite 2210
Raleigh, North Carolina 27601
Phone: (919) 834-8398
Fax: (919) 828-2707

October 14, 1993

Mr. Guy C. Pearce
North Carolina Department of
Environment, Health and Natural Resources
1424 Carolina Avenue
Post Office Box 2188
Washington, North Carolina 27889

RE: E. I. du Pont de Nemours - Kentec Site
Lenoir County
Incident No. 6334

Dear Mr. Pearce:

I write regarding DuPont's commitments and responsibilities concerning the Kentec Groundwater situation.

BACKGROUND

By letter dated March 24, 1993, the Groundwater Section of the Division of Environmental Management asked DuPont to proceed with certain offsite assessment activities specified in the Division's letter to me of May 8, 1991. DuPont had advised the Division in May of 1991 that we were unable to conduct offsite testing at that time because the owners of neighboring properties had retained counsel and denied us access to the properties.

In February 1993, a federal judge ordered the neighbors who are suing DuPont to conclude their groundwater testing of their own properties by May 31, 1993, and to provide DuPont with all testing data by June 15, 1993. This same federal order also directed Du Pont to conduct any groundwater testing it desired to conduct of the neighbors' properties between July 1, 1993 and September 30, 1993, and to file an expert's affidavit by October 15, 1993 indicating the extent, if any, of contamination.

Last spring, for reasons of efficiency, economy, and convenience, DuPont suggested to you that its offsite testing program pursuant to the Groundwater Section's directive take place simultaneously with DuPont's obligations under the federal court's schedule. DuPont was to report its results to the Groundwater Section by October 15, 1993. On August 13, 1993, however, the federal court postponed indefinitely the time for DuPont to conduct offsite

testing and submit an expert's affidavit. Consequently, DuPont has done neither.

Nonetheless, certain facts have been developed by CH2M HILL, DuPont's technical consultant for the Kentec groundwater remediation. In light of DuPont's commitment to timely inform the Groundwater Section of all pertinent facts, we are making such information available to you at this time.

CH2M HILL has both evaluated its own sampling and water flow data, and has examined certain data submitted by the Plaintiff-neighbors pursuant to their obligations in the federal lawsuit. While DuPont is unaware of all of the details concerning how the Plaintiffs' data was collected and analyzed, CH2M HILL has assumed for these purposes only that the sampling data collected by the Plaintiffs is accurate and reliable.

ONSITE GROUNDWATER RESULTS

As you know, DuPont has been operating a collection trench and oxidation treatment system at Kentec continuously for the past fourteen months. During this time, DuPont has withdrawn and treated over three million gallons of groundwater. The apparent effectiveness of this collection trench for containing to the Kentec property any migration of contamination is demonstrated both by the analytical data collected during onsite quarterly groundwater monitoring and by the analytical data collected offsite by the Plaintiffs.

Table 1 gives the analytical results for the two DuPont monitoring wells, MW-10A and MW-11A, that are located on Kentec property, but downgradient of the collection trench to the southeast (see Figure 1).[1] These data include one round of sampling in December, 1991 and one round of sampling immediately prior to startup (July, 1992). The next four events are the quarterly monitoring of the groundwater during operation of the trench. Table 1 shows that the concentrations have decreased to below detectable limits for the three target compounds, 1,1-dichloroethene(DCE), 1,1-dichloroethane(DCA), and 1,4-dioxane. These data indicate that contamination is no longer migrating within the surficial aquifer to the area of these wells.

---

[1] Tables 1 and 2 and Figure 1, prepared by CH2M HILL, are attached hereto as Exhibit A.

OFFSITE GROUNDWATER RESULTS

The Plaintiffs have used two consultants to collect data on some of their properties. Dr. Richard Ellis of Advanced Waste Management Systems, Inc. in Hixson, Tennessee installed and sampled three shallow monitoring wells outside of the Kentec property in June, 1991. These wells are shown as MW-A, MW-F, and MW-G on Figure 1. Groundwater Management Associates (GMA) from Cary, North Carolina installed four additional monitoring wells (MWs C, D, E, and I) in 1992 and 1993. Three of the monitoring wells are shallow (-15 feet) and the fourth, MW-I, is installed into the Peedee aquifer (34 feet deep).[2] GMA collected and analyzed groundwater samples in 1992 and 1993 from these seven monitoring wells, from one offsite well installed by CH2M HILL prior to the lawsuit (MW-H) and from two temporary borings (TB-1 and TB-2).[3]

In the Kentec Groundwater Assessment Report (April, 1991), CH2M HILL showed that surficial aquifer groundwater flow to the north and west from Kentec would discharge into the drainageway bordering the west boundary of the Kentec property. Groundwater in the surficial aquifer would not migrate from Kentec beyond the drainageway, thereby delineating the limits of the groundwater contamination in those directions.

With regard to the south and east, the most recent groundwater data from GMA indicate that no DCA, DCE or 1,4-dioxane were observed above the detection limits in monitoring wells furthest from the Kentec property (MWs H, F, D, and G). In addition, no groundwater contamination was detected in the offsite Peedee aquifer monitoring well, MW-I.

At three of the locations, MW A, MW F, and MW G, sampling rounds have been performed by the Plaintiffs' consultants (see Table 2 and Figure 1). At each of these locations, the first round of sampling (June, 1991) took place prior to the installation of the collection trench. The subsequent rounds of sampling were performed after the collection system was operational. The data for these wells show that the groundwater contamination has substantially decreased during the operation of the trench system.

---

[2] All groundwater sample locations are given in Figure 1, and a summary of the groundwater data collected from these locations by the Plaintiffs is set forth in Table 2. (See Exhibit A, attached hereto.)

[3] A collection of the tables and figures from GMA is attached hereto as Exhibit B.

CONCLUSION

The onsite and offsite analytical results indicate that the groundwater plume does not extend as far to the southeast as MWs H, F, D, and G. Therefore, no additional surficial aquifer groundwater monitoring downgradient of those existing offsite wells is necessary to assess the extent of that plume.

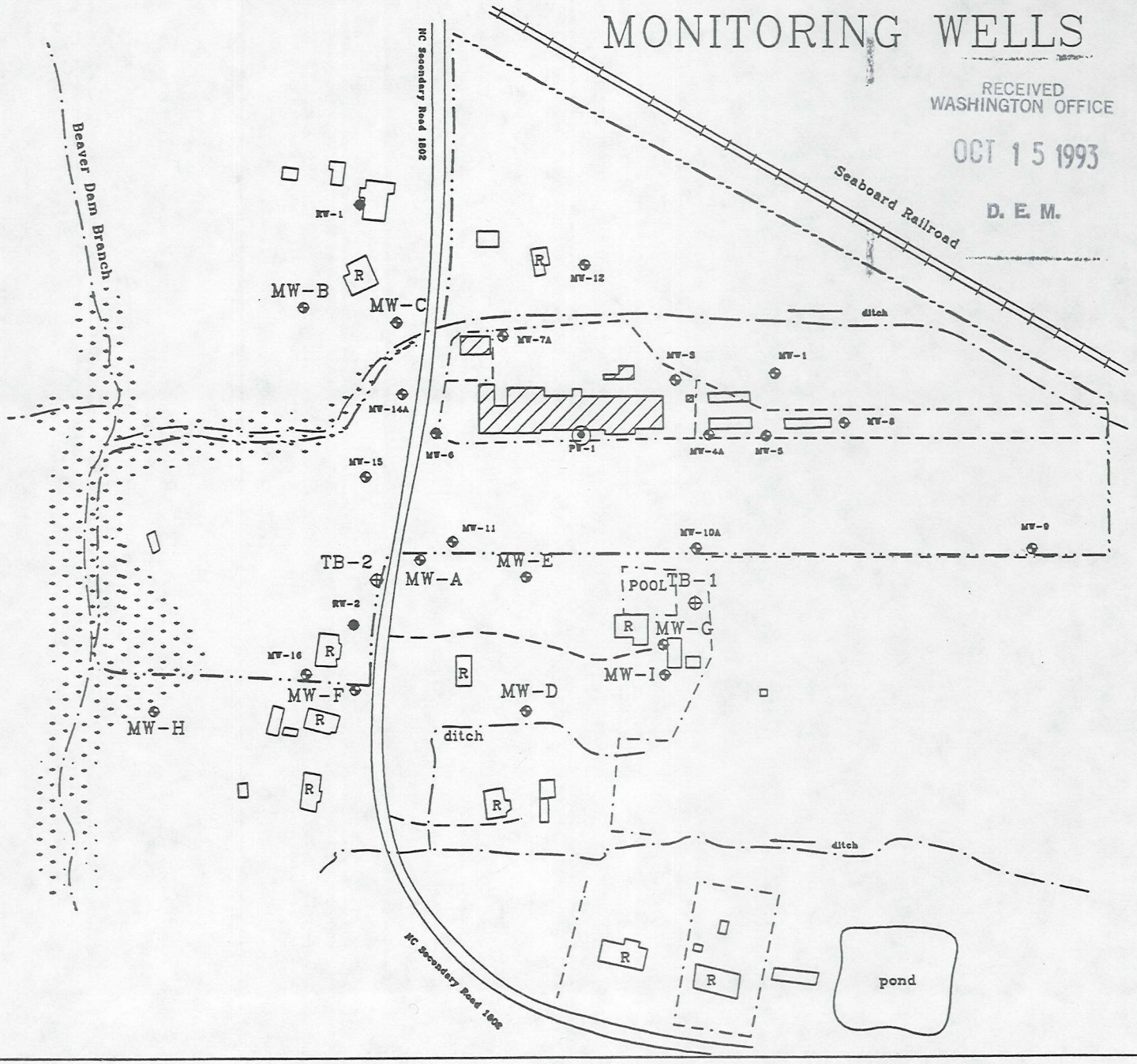
If I can be of any further assistance, please do not hesitate to call on me.

Sincerely,

Jerry D. Henderson, Manager
NC Environmental Affairs

FIGURE 1

LOCATIONS OF TEMPORARY AND PERMANENT MONITORING WELLS



property line

ditch/creek

fence

swamp, frequently inundated with water

railroad

industrial facility

R residence

MW-A monitoring well installed by GMA

TB-1 temporary boring installed by GMA

MW-9 monitoring well owned by Kentec, Inc.

PW-1 abandoned production well owned by Kentec, Inc.

RW-1 recovery well owned by Kentec, Inc.

MAP DIGITIZED FROM A MAP DRAWN BY CH2M HIL

NORTH

SCALE

0 125 250 500

1 inch = 250 feet

Table 1
Kentec Quarterly Groundwater Data
Monitoring Wells 10A and 11A
Sampled by DuPont
(All concentrations in ppb)

Well Number	Date	1,1-DCE	1,1-DCA	1,4-Dioxane
MW-10A	Dec-91	23	210	<150
	Jul-92	<1.0	120	580
	Nov-92	<7	8.9	<150
	Feb-93	<7	<7	<150
	Apr-93	<7	<7	<150
	Jul-93	<7	<7	<150
MW-11A	Dec-91	41	240	222
	Jul-92	11	71	150
	Nov-92	9.1	64	<150
	Feb-93	<7	15	<150
	Apr-93	<7	<7	<150
	Jul-93	<7	<7	<150

Table 2
Analytical Results of Groundwater Samples for Offsite Monitoring Wells
Sampled by Plaintiffs
(All Concentrations in ppb)

Monitoring Well	Sample Date	Chloro-ethane	1,1-DCA	1,1-DCE	1,1,1-TCA	1,4-Dioxane
MW-A	6/13/91	69	53	26	<4	44 J
	12/15/92	<5	9.8	<5	6	<50
MW-C	12/15/92	<5	<5	<5	<5	<50
MW-D	12/15/92	<5	<5	<5	<5	<50
MW-E	12/15/92	<5	<5	<5	<5	<50
MW-F	6/13/91	<3	<2	4	<4	6 J
	12/15/92	<5	<5	<5	<5	<50
MW-G	6/16/91	22	270	23	<4	35 J
	12/15/92	<5	7.7	<5	<5	<50
	4/16/93	28.9	3.3 J	2.3 J	<5	<50
MW-H	4/16/93	<5	<5	<5	<5	<50
MW-I	3/3/93	<5	<5	<5	<5	<50
TB-1	4/16/93	<5	<5	<5	<5	<50
TB-2	3/22/93	<5	<5	<5	<5	<50

Notes:
J = Estimated Value below Instrument Detection Limit
MW = Monitoring Well
TB = Test Boring
DCA = 1,1-Dichloroethane
DCE = 1,1-Dichloroethene
TCA = 1,1,1-Trichloroethane

Table 1. Depths and Screened Intervals of Permanent and Temporary Monitoring Wells

Monitoring Well	Depth of Well (in feet)	Screened Interval (in feet below land surface)
MW-A	12	
MW-B		
MW-C	13	7 to 13
MW-D	5.8	1.3 to 5.8
MW-E	8	2 to 8
MW-F	12.5	
MW-G	13.5	
MW-H	8	
MW-I	34	24 to 34
TB-1	10	0 to 10
TB-2	5	-

Table 2. Water Level Measurements

Monitoring Well	Top of Casing	Depth	Elev.	Depth	Elev.	Depth	Elev.
		October 23, 1992		March 3, 1993		April 16, 1993	
MW-A	33.84	3.21	**30.63**	2.44	**31.40**	1.46	**32.38**
MW-B	31.68	4.06	**27.62**	3.47	**28.21**	3.26	**28.42**
MW-C	31.99	7.04	**24.95**	4.32	**27.67**	3.92	**28.07**
MW-D	32.20	1.81	**30.39**	1.16	**31.04**	0.19	**32.01**
MW-E	35.51	4.77	**30.74**	3.88	**31.63**	3.63	**31.88**
MW-F	36.05	6.11	**29.94**	5.44	**30.61**	5.05	**31.00**
MW-G	35.89	5.33	**30.56**	4.22	**31.67**	3.86	**32.03**
MW-H	27.08	3.49	**23.59**	3.06	**24.02**	2.25	**24.83**

Depth = Depth to water from top of casing, in feet
Elev. = Elevation of water in well, in feet
Elevations are relative to an assumed benchmark.
MW = monitoring well

Table 3. Analytical Results of Groundwater and Surface Water Samples

Monitoring Well	Sample Date	Chloro-ethane[1]	1,1-DCA	1,1-DCE	1,1,1-TCA
NCAC 2L Standards for Groundwater in ug/l (micrograms per liter) or parts per billion (ppb)		**NR**	**(700)***	**7.0**	**(200)***
MW-A	12/15/92	<5	9.8	<5	6.0
MW-C	12/15/92	<5	<5	<5	<5
MW-D	12/15/92	<5	<5	<5	<5
MW-E	12/15/92	<5	<5	<5	<5
MW-F	12/15/92	<5	<5	<5	<5
MW-G	4/16/93	28.9	3.3J	2.3J	<5
	12/15/92	<5	7.7	<5	<5
MW-H	4/16/93	<5	<5	<5	<5
MW-I	3/3/93	<5	<5	<5	<5
SW	3/3/93	13.7	19.3	<5	92.2
SW-3	3/22/93	<5	<5	<5	<5
SW-4	3/22/93	<5	<5	<5	<5
SW-5	3/22/93	<5	<5	<5	<5
TB-1	4/16/93	<5	<5	<5	<5
TB-2	3/22/93	<5	<5	<5	<5

NR - non-regulated compound listed by the Environmental Protection Agency (EPA)
J = estimated value (detection limit is 5.0 parts per billion)

Areas that are shaded indicate concentrations that exceed the North Carolina Administrative Code (NCAC) 2L water quality standards. A violation of the NCAC 2L standards for groundwaters of the state may result from "Substances which are not naturally occurring and for which no standard is specified shall not be permitted in detectable concentrations in Class GA or Class GSA groundwaters." (NCAC 2L Standards, Section .0202).

* - indicates proposed NCAC 2L standards

MW = monitoring well
SW = surface water
TB = test boring

DCA = Dichloroethane
DCE = Dichloroethylene
TCA = Trichloroethane

Table 4. Analytical Results of the Sediment Sample

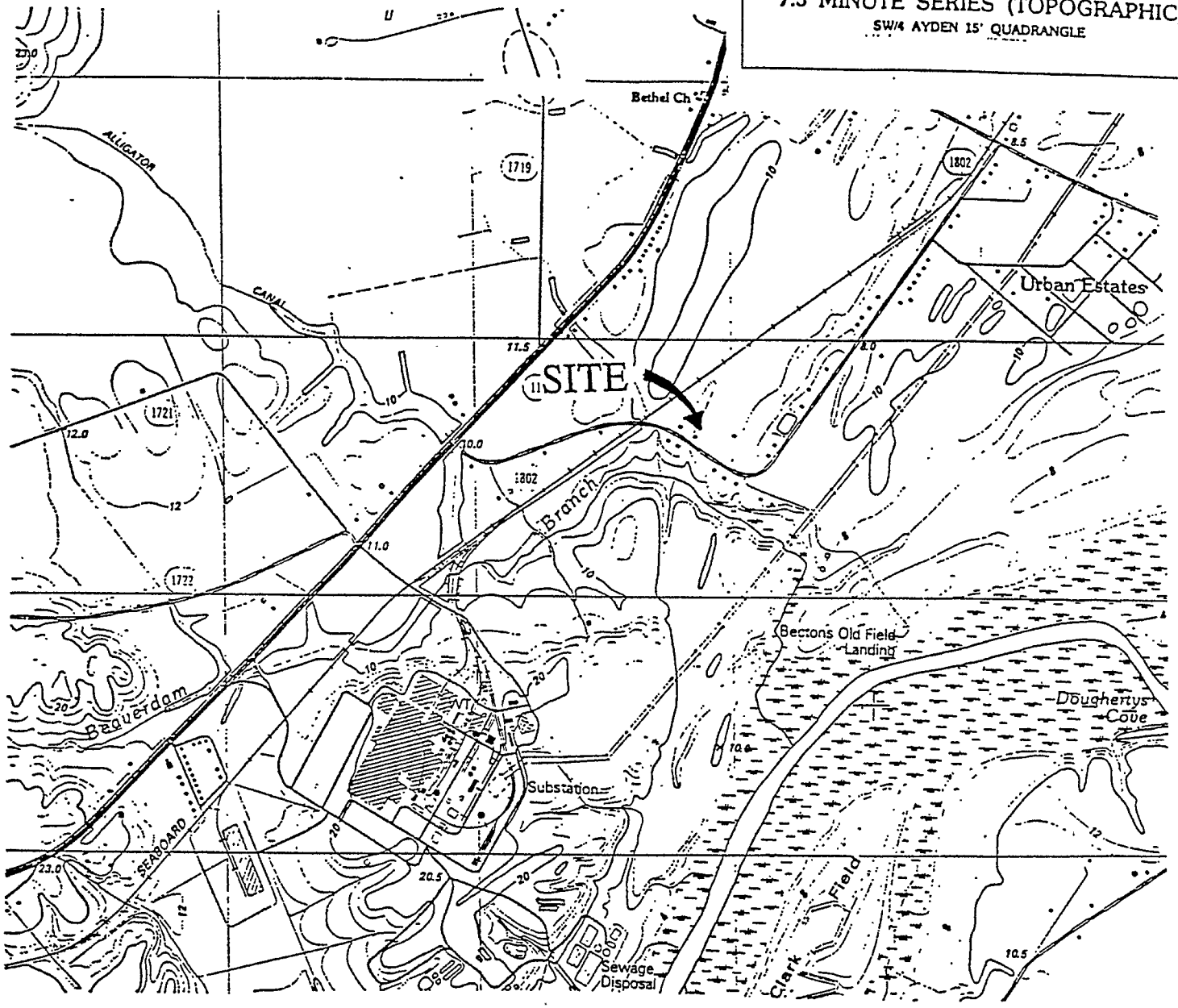
Sample number	Date	EPA Method 624	Depth of sample	Collected by
SS-1	3/22/93	Toluene -1270 ppb	2	GMA

depths are in feet

GMA = Groundwater Management Associates, Inc.

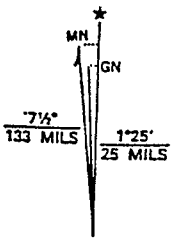
EPA Method 8240. The detection limit for the other compounds listed under this method was 100 ug/kg or parts per billion.

GRIFTON QUADRANGLE
NORTH CAROLINA
7.5 MINUTE SERIES (TOPOGRAPHIC)
SW/4 AYDEN 15' QUADRANGLE



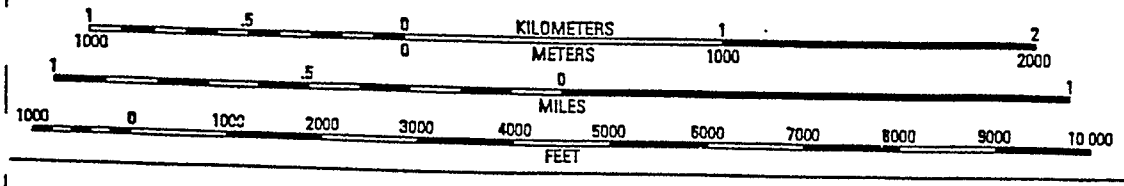
LEGEND

QUADRANGLE LOCATION



UTM GRID AND 1983 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

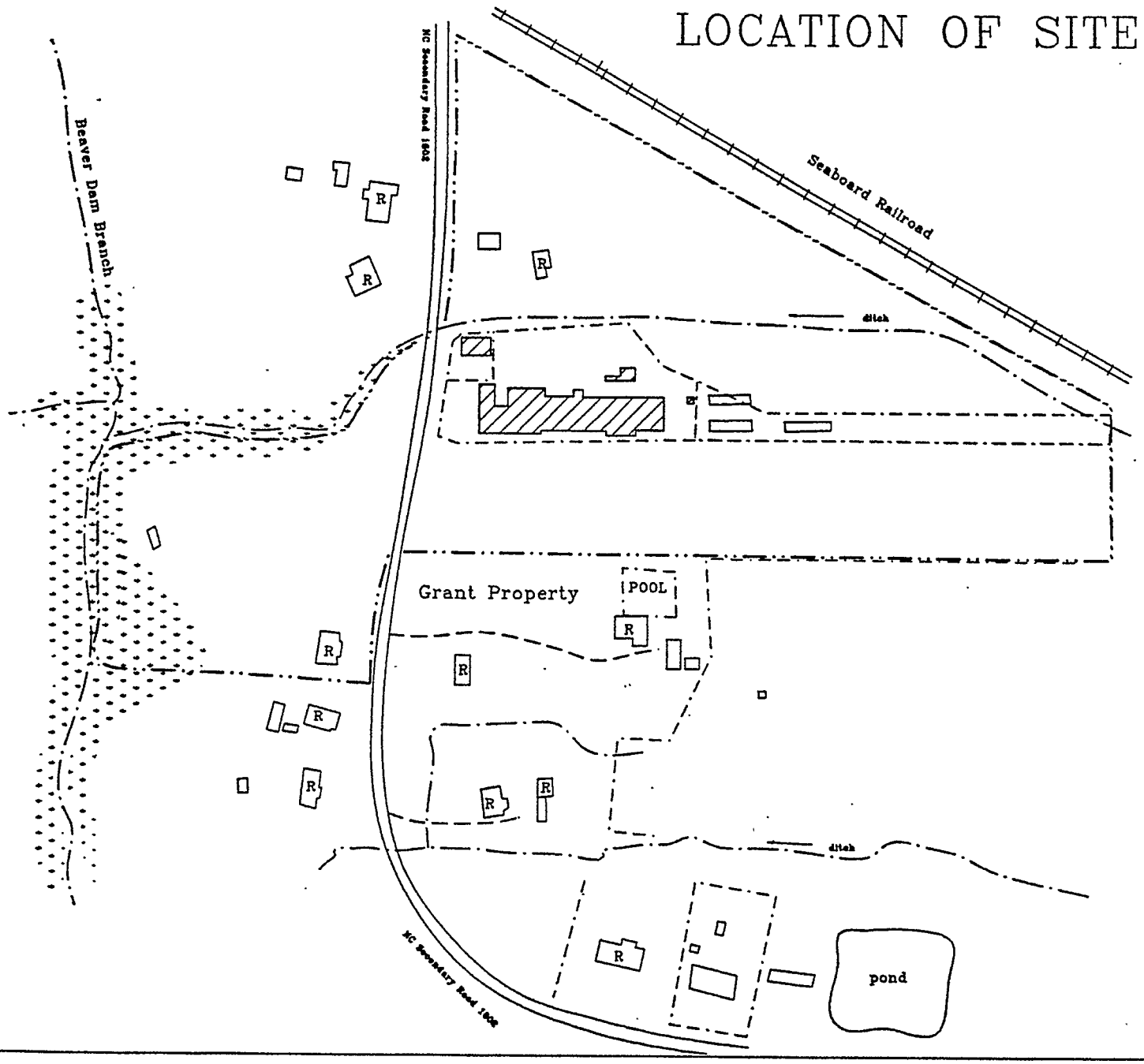
SCALE 1:24 000



GROUNDWATER MANAGEMENT ASSOCIATES, INC. | Figure 1

P01216

LOCATION OF SITE



property line

ditch/creek

fence

swamp, frequently inundated with water

railroad

industrial facility

R residence

MAP DIGITIZED FROM A MAP DRAWN BY CH2M HIL

NORTH

SCALE

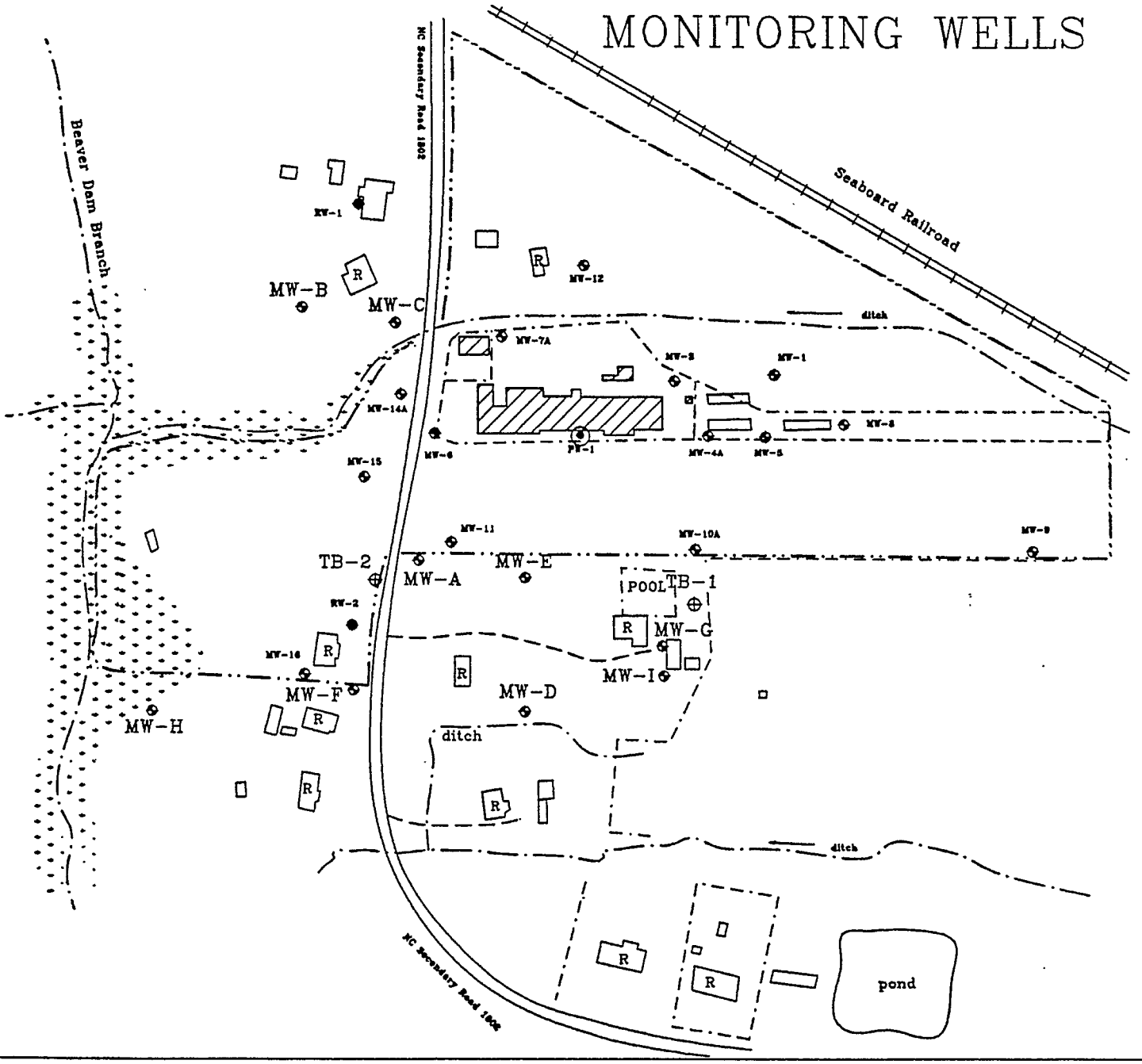
0 125 250 500

1 inch = 250 feet

GROUNDWATER MANAGEMENT ASSOCIATES, INC. | Figure 2

P01217

LOCATIONS OF TEMPORARY AND PERMANENT MONITORING WELLS



property line

ditch/creek

fence

swamp, frequently inundated with water

railroad

industrial facility

R residence

MW-A monitoring well installed by GMA

TB-1 temporary boring installed by GMA

MW-9 monitoring well owned by Kentec, Inc.

PW-1 abandoned production well owned by Kentec, Inc.

RW-1 recovery well owned by Kentec, Inc.

MAP DIGITIZED FROM A MAP DRAWN BY CH2M HIL

NORTH

SCALE

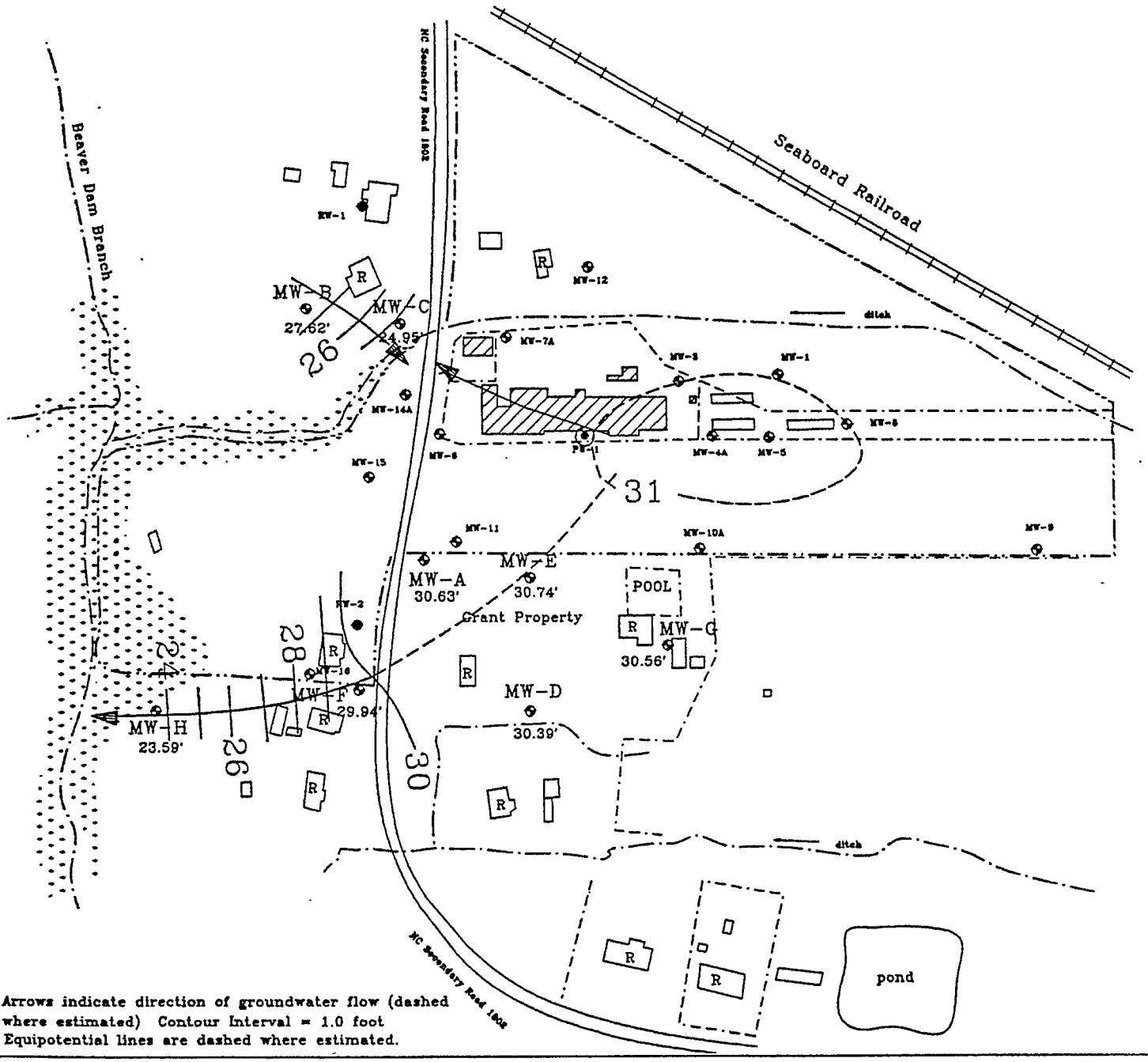
0 125 250 500

1 inch = 250 feet

GROUNDWATER MANAGEMENT ASSOCIATES, INC. | Figure 3

P01218

EQUIPOTENTIAL MAP, OCTOBER 23, 1992



Arrows indicate direction of groundwater flow (dashed where estimated) Contour Interval = 1.0 foot
Equipotential lines are dashed where estimated.

property line

ditch/creek

fence

swamp, frequently inundated with water

railroad

industrial facility

R residence

MW-A monitoring well installed by GMA

30.00 water level measurements

TB-1 temporary boring installed by GMA

MW-9 monitoring well owned by Kentec, Inc.

PW-1 abandoned production well owned by Kentec, Inc.

RW-1 recovery well owned by Kentec, Inc.

MAP DIGITIZED FROM A MAP DRAWN BY CH2M HIl

NORTH

SCALE

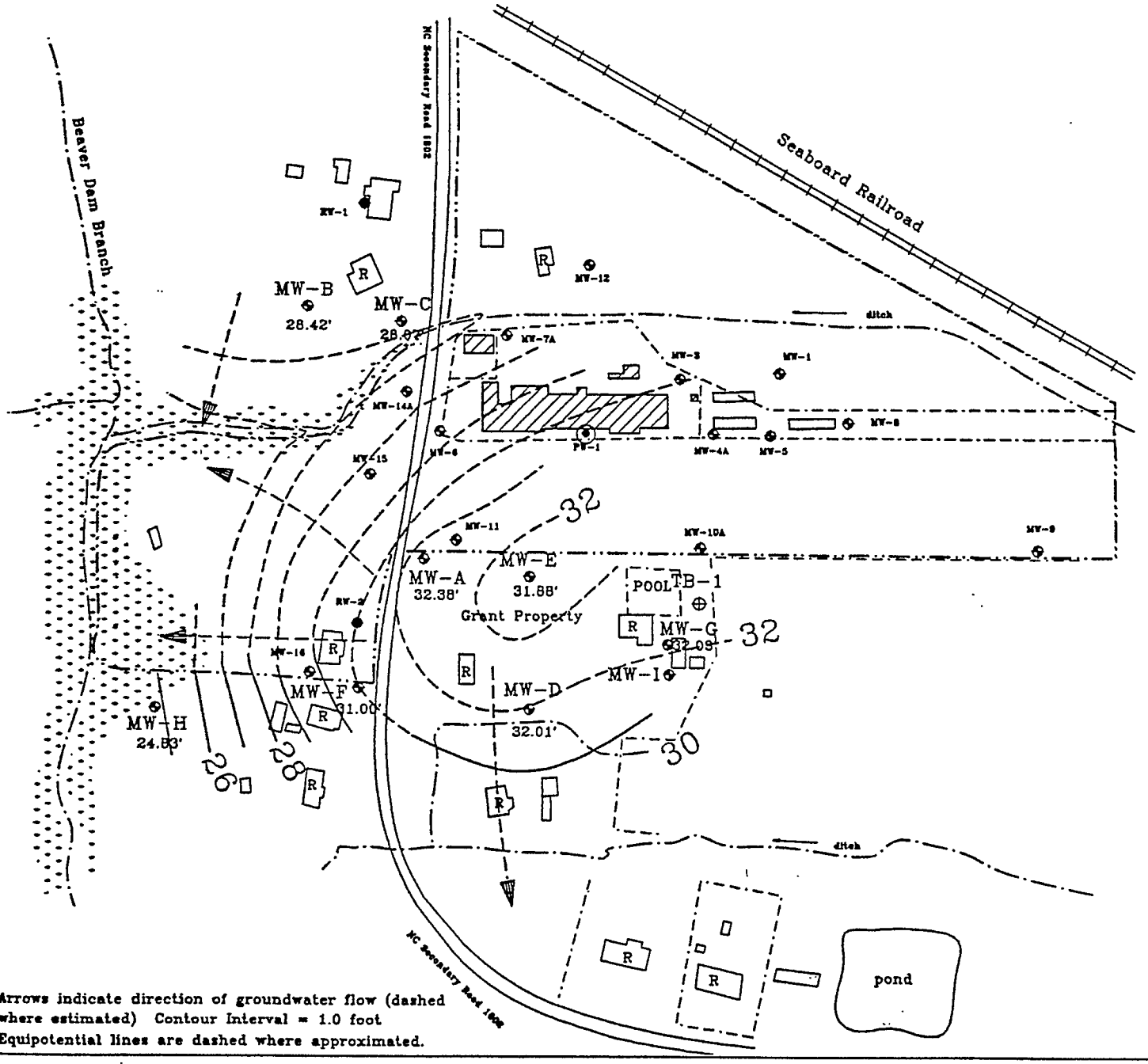
0 125 250 500

1 inch = 250 feet

GROUNDWATER MANAGEMENT ASSOCIATES, INC. | Figure 4

P01219

EQUIPOTENTIAL MAP, APRIL 16, 1993



Arrows indicate direction of groundwater flow (dashed where estimated) Contour Interval = 1.0 foot
Equipotential lines are dashed where approximated.

property line

ditch/creek

fence

swamp, frequently inundated with water

railroad

industrial facility

R residence

MW-A monitoring well installed by GMA

30.00 water level measurements

TB-1 temporary boring installed by GMA

MW-9 monitoring well owned by Kentec, Inc.

PW-1 abandoned production well owned by Kentec, Inc.

RW-1 recovery well owned by Kentec, Inc.

MAP DIGITIZED FROM A MAP DRAWN BY CH2M HIL

NORTH

SCALE

0 125 250 500

1 inch = 250 feet

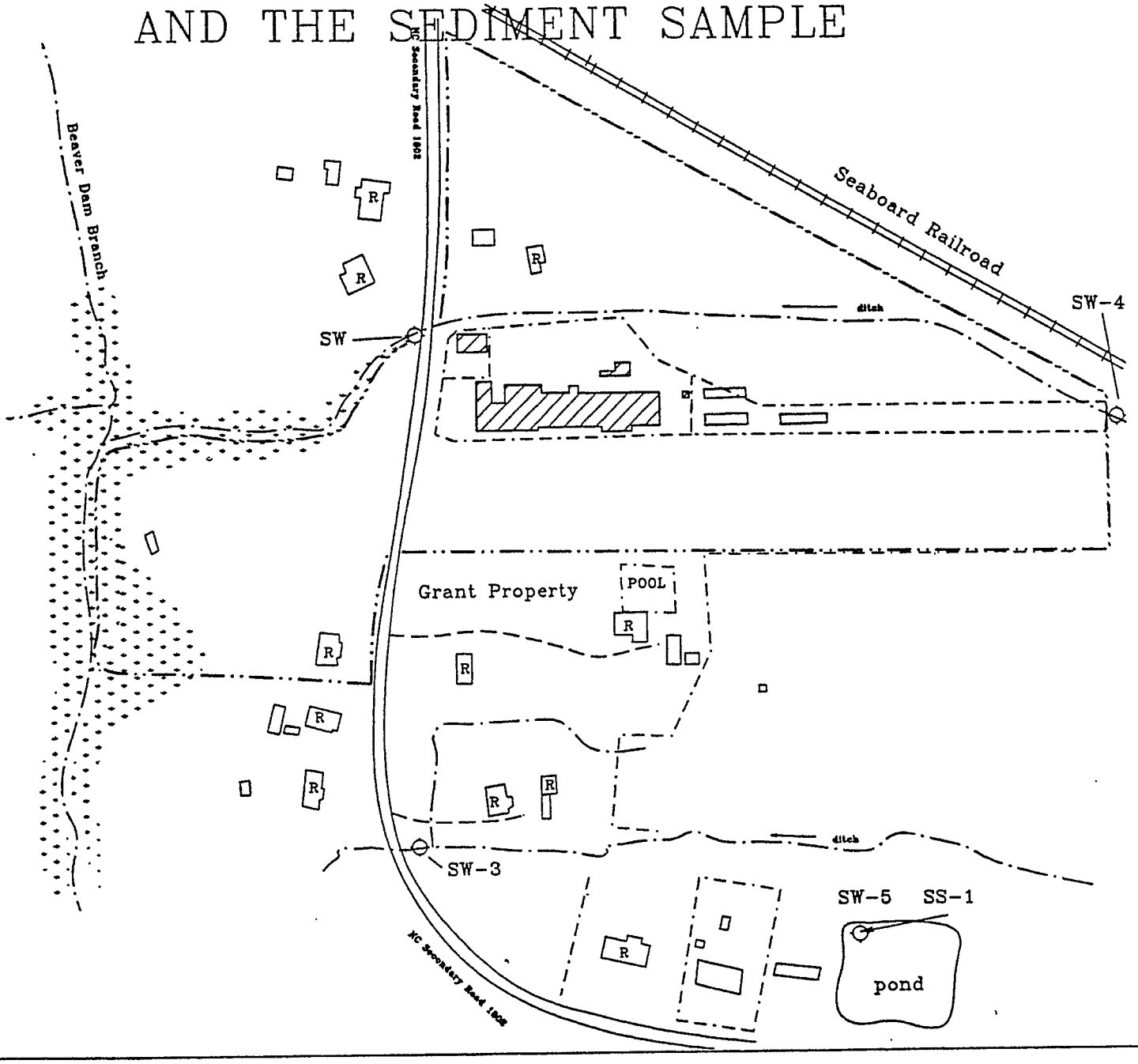
GROUNDWATER MANAGEMENT ASSOCIATES, INC. | Figure 5

P01220

There does not appear to be a "area of influence" (drawdown) in the vicinity of the GW collection Trench.

Why?

LOCATIONS OF SURFACE WATER SAMPLES AND THE SEDIMENT SAMPLE



property line

ditch/creek

fence

swamp, frequently inundated with water

railroad

industrial facility

R residence

SW-2 surface water sample

The sediment sample (SS-1) was collected from the same location as SW-5.

MAP DIGITIZED FROM A MAP DRAWN BY CH2M HIL

NORTH

SCALE

0 125 250 500

1 inch = 250 feet

GROUNDWATER MANAGEMENT ASSOCIATES, INC. | Figure 6

P01221

R-12003-K REV. 8-90

July 1993 sampling event

RECEIVED
WASHINGTON OFFICE

OCT 12 1993

D. E. M.

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
KINSTON PLANT
P.O. BOX 800
KINSTON, NORTH CAROLINA 28502-0800
PHONE (919) 522-6111

FIBERS DEPARTMENT

October 7, 1993

Mr. Willie A. Hardison
Div. of Environmental Management
Groundwater Section
P. O. Box 1507
Washington, NC 27889

Subject: Permit No. WQ0005906
E. I. du Pont de Nemours & Co. Inc.
Kentec Site, SIC Code No. 7399
Groundwater Remediation System
Lenoir County

Dear Mr. Hardison:

Pursuant to the requirements of the subject permit, here are the data for the specified time frames. If there are any questions, please give me a call on (919) 522-6263.

Sincerely,

J. D. Henderson, Manager
N.C. Environmental Affairs

JDH/jkj
Attachments

CH2M HILL

MEMORANDUM

TO: Jerry Henderson/ Du Pont

FROM: Doug Dronfield/ CH2M HILL

DATE: September 15, 1993

SUBJECT: Kentec Quarterly Groundwater Data and Monthly Railcar Data

Enclosed are the quarterly groundwater monitoring data results (May through July, 1993), the railcar concentrations, and monthly railcar average concentrations for the same time period (May through July, 1993). The submittal of this data to the state complies with Section II.2. of the June 17, 1992 Groundwater Remediation Permit.

The railcar data (effluent from the groundwater treatment plant) are well within the limits established by in the permit (Section I.27).

Kentec Quarterly Groundwater Data
July , 1993
All Concentrations are PPB

Well Number	Date	1,1-Dichloro-ethene	1,1-Dichloro-ethane	1,4-Dioxane
MW-1	Jul-93	< 7	< 7	390
MW-3	Jul-93	42	17	770
MW-4A	Jul-93	< 7	25	2000
MW-4B	Jul-93	< 7	< 7	< 150
MW-6	Jul-93	< 7	< 7	8900
MW-7A	Jul-93	29	< 7	3800
MW-7B	Jul-93	< 7	< 7	< 150
MW-8	Jul-93	< 7	50	310
MW-9	Jul-93	< 7	< 7	< 150
MW-10A	Jul-93	< 7	< 7	< 150
MW-10B	Jul-93	< 7	< 7	< 150
MW-11A	Jul-93	< 7	< 7	< 150
MW-11B	Jul-93	< 7	< 7	< 150
MW-12	Jul-93	< 7	< 7	< 150
MW-14A	Jul-93	< 7	< 7	1000
MW-14B	Jul-93	< 7	< 7	< 150
MW-15	Jul-93	< 7	62	300
MW-16	Jul-93	< 7	< 7	< 150
MW-18	Jul-93	< 7	< 7	< 150
SW-11	Jul-93	< 7	< 7	< 150
SW-24	Jul-93	< 7	< 7	< 150
PS-2	Jul-93	150	1200	250

Kentec Groundwater Treatment Facility
May - July, 1993
Railcar

Identification Code	Date	Time	DCE (ppb)	DCA (ppb)	1,4 Dioxane (ppb)
	May				
Railcar 94041	3	730	<5	<5	<100
Railcar 34064	7	-	<5	<5	<100
Railcar 94041	11	800	6	<5	<100
Railcar 34064	14	730	<5	8	<100
Railcar 94041	18	800	<5	8	<100
Railcar 34064	24	730	<5	6	<100
Railcar 94041	26	800	<5	7	<100
Monthly Average			5.1	6.3	<100
	June				
Railcar 34064	1	730	<5	5	<100
Railcar 94041	2	730	<5	5	132
Railcar 34064	4	730	<5	<5	<100
Railcar 94041	7	730	<5	9	<100
Railcar 34064	10	730	<5	5	<100
Railcar 94041	14	730	5	14	<100
Railcar 34064	16	730	<5	8	<100
Railcar 94041	21	730	<5	<5	<100
Railcar 34064	23	800	14	<5	<100
Railcar 94041	25	730	<5	5	<100
Railcar 34064	28	800	<5	<5	<100
Monthly Average			5.8	6.5	102.9
	July				
Railcar 34064	6	700	5	<5	<100
Railcar 94041	8	730	<5	<5	<100
Railcar 34064	12	700	6	6	<100
Railcar 94041	14	700	<5	<5	<100
Railcar 34064	19	700	<5	<5	<100
Railcar 94041	22	730	<5	<5	<100
Railcar 34064	26	800	<5	<5	<100
Railcar 94041	28	730	<5	<5	<100
Railcar 34064	30	700	<5	<5	<100
Monthly Average			5.1	5.1	<100

Kentec Groundwater Data
Water-Level Elevations
July 12, 1993

(feet above mean sea level)

Monitoring Well	Elevation of Potentiometric Surface
MW1	24.45
MW3	24.86
MW4A	24.70
MW4B	21.68
MW6	23.61
MW7A	24.21
MW7B	21.80
MW8	24.26
MW9	24.20
MW10A	24.47
MW10B	20.58
MW11A	*
MW11B	21.21
MW12	24.01
MW14A	*
MW14B	21.58
MW15	21.26
MW16	23.68
MW18	*

* The water level in these wells was below the top of the pump

State of North Carolina
Department of Environment,
Health and Natural Resources

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
Steven J. Levitas, Deputy Secretary

DEHNR

DIVISION OF ENVIRONMENTAL MANAGEMENT

GROUNDWATER SECTION

TO: Groundwater Regional Supervisor

Under the Freedom of Information Act, I hereby request access to the Groundwater file(s) (# 6334 SP .)
I make this request on behalf of and as an agent for
KENTEC .

I understand, that if I remove, alter, deface, mutilate or destroy any record related to the above file(s), I shall be guilty of a misdemeanor and upon conviction fined up to $500.00 (G.S. 132-3 Destruction of Records regulated).

Thank you for your cooperation.

Signed: [signature] Date: 7/19/93

(Address)
11,005 Mason Ridge Dr
Raleigh NC

Phone: 846-1556

P.O. Box 2188, Washington, North Carolina 27889-2188 Telephone 919-946-6481 FAX: 919-975-3716 / 919-946-6639

EXTERNAL AFFAIRS
150 Fayetteville Street Mall, Suite 2210
Raleigh, North Carolina 27601
Phone: (919) 834-8398
Fax: (919) 828-2707

June 29, 1993

Mr. Guy C. Pearce
North Carolina Department of
Environment, Health and Natural Resources
1424 Carolina Avenue
Post Office Box 2188
Washington, North Carolina 27889

RE: E. I. du Pont de Nemours - Kentec Site
Lenoir County
Incident No. 6334

Dear Guy:

In confirmation of our conversation today, I called you to discuss the status of any offsite definition of the groundwater contamination plume at the above-referenced location. As envisioned in my letter to you of March 31, 1993, some of the neighbors of the Kentec facility, who are suing Du Pont, have now provided us with certain property testing data. Our consultants are currently evaluating that information.

Unfortunately, the data furnished by the plaintiffs is incomplete. For example, there are no logbooks, well installation documents, laboratory supporting data, etc. We have asked the plaintiffs' counsel to provide such materials.

Until our consultants are in a position to review the requested data, we will be unable to determine the necessity and extent of offsite testing. Moreover, we may be barred by a federal confidentiality order from providing you with the information supplied to us by the plaintiffs.

I will be back in touch with you once we have become able to evaluate sufficient data to formulate an offsite testing plan. Should you need any further information in the meantime, please do not hesitate to give me a call.

Sincerely,

Jerry D. Henderson

R-12003-K REV. 8-90

April 1993 sampling event

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
KINSTON PLANT
P.O. BOX 800
KINSTON, NORTH CAROLINA 28502-0800
PHONE (919) 522-6111
FIBERS DEPARTMENT

June 23, 1993

Mr. Willie A. Hardison
Div. of Environmental Mgmt.
Groundwater Section
P. O. Box 1507
Washington, NC 27889

Subject: Permit No. WQ0005906
E. I. du Pont de Nemours & Co., Inc.
Kentec Site, SIC Code No. 7399
Groundwater Remediation System
Lenoir County

Dear Mr. Hardison,

Pursuant to requirements of the subject permit, enclosed are groundwater monitoring data and railcar data for the months of March and April, 1993. Note these data are for a two month period rather than for a full quarter.

For a number of business reasons, we would like to move this quarterly sampling episode one month earlier forward. Future sampling periods will be for a full quarter. If there are any problems with adjusting this timing, please let me know. I can be reached on (919) 522-6263.

Sincerely,

Jerry D. Henderson, Manager
N.C. Environmental Affairs

JDH/jkj

Enclosures

MEMORANDUM CH2M HILL

TO: Jerry Henderson/ Du Pont

FROM: Doug Dronfield/ CH2M HILL

DATE: June 10, 1993

SUBJECT: Kentec Quarterly Groundwater Data and Monthly Railcar Data

Enclosed are the quarterly groundwater monitoring data results (March through April, 1993), the railcar concentrations, and monthly railcar average concentrations for the same time period (March through April, 1993). The submittal of this data to the state complies with Section II.2. of the June 17, 1992 Groundwater Remediation Permit.

The railcar data (effluent from the groundwater treatment plant) are well within the limits established by in the permit (Section I.27).

Kentec Quarterly Groundwater Data
April 1993
All Concentrations are PPB

Well Number	Date	1,1-Dichloro-ethene	1,1-Dichloro-ethane	1,4-Dioxane
MW-1	Apr-93	< 7	< 7	< 150
MW-3	Apr-93	14	< 7	< 150
MW-4A	Apr-93	15	11	860
MW-4B	Apr-93	< 7	< 7	< 150
MW-6	Apr-93	< 7	< 7	8000
MW-7A	Apr-93	57	< 7	3300
MW-7B	Apr-93	< 7	< 7	< 150
MW-8	Apr-93	< 7	< 7	< 150
MW-9	Apr-93	< 7	< 7	< 150
MW-10A	Apr-93	< 7	< 7	< 150
MW-10B	Apr-93	< 7	< 7	< 150
MW-11A	Apr-93	< 7	< 7	< 150
MW-11B	Apr-93	< 7	< 7	< 150
MW-12	Apr-93	< 7	< 7	< 150
MW-14A	Apr-93	< 7	< 7	280
MW-14B	Apr-93	< 7	< 7	< 150
MW-15	Apr-93	8.5	12	180
MW-16	Apr-93	< 7	< 7	< 150
MW-18	Apr-93	< 7	< 7	< 150
SW-11	Apr-93	< 7	< 7	150
SW-24	Apr-93	< 7	< 7	< 150
PS-2	Apr-93	< 7	21	< 150

Kentec Groundwater Treatment Facility
March - April, 1993
Railcar

Identification Code	Date	Time	DCE (ppb)	DCA (ppb)	1,4 Dioxane (ppb)
	March				
Railcar 94041	2	720	<5	<5	<100
Railcar 34064	5	730	<5	<5	<100
Railcar 94041	8	730	<5	<5	<100
Railcar 34064	16	730	<5	<5	<100
Railcar 94041	17	730	<5	<5	<100
Railcar 34064	19	730	<5	<5	<100
Railcar 94041	22	700	<5	<5	<100
Railcar 34064	25	730	<5	<5	<100
Railcar 94041	29	730	<5	<5	<100
Monthly Average			<5	<5	<100
	April				
Railcar 34064	1	700	12	<5	<100
Railcar 34064	7	730	<5	5	<100
Railcar 94041	8	730	<5	<5	<100
Railcar 34064	12	730	<5	<5	<100
Railcar 94041	13	730	<5	<5	<100
Railcar 34064	16	800	<5	<5	<100
Railcar 94041	19	700	<5	<5	<100
Railcar 34064	23	730	<5	<5	<100
Railcar 94041	26	730	<5	8	<100
Railcar 34064	30	730	<5	<5	<100
Monthly Average			5.7	5.3	<100

R-12003-K REV. 8-90

DUPONT
REG US PAT & TM OFF
ESTABLISHED 1802

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
KINSTON PLANT
P.O. BOX 800
KINSTON, NORTH CAROLINA 28502-0800
PHONE (919) 522-6111
FIBERS DEPARTMENT

April 23, 1993

Mr. Guy C. Pearce
N.C. Department of Environment,
Health & Natural Resources
P. O. Box 2188
Washington, NC 27889

Dear Mr. Pearce,

Following up on our telephone conversation earlier this week, here is the additional information I promised. Enclosed is a table showing the water level elevations in the monitoring wells sampled as a part of the Kentec Quarterly Groundwater Sampling Plan. Also enclosed are several memos relative to the dewatering holding lagoon constructed to contain water collected during the installation of the groundwater interceptor trench. This lagoon is referenced in Permit #WQ0005906 dated 12/23/91. This holding lagoon was constructed immediately following the issuance of the permit. Following completion of the interceptor trench, a closure plan for the holding lagoon was submitted to the state and approved by letter from Mr. Alton R. Hodge on 4/23/92. Copies of these documents are enclosed. The lagoon was permanently closed during the week of 5/22/92.

I believe this addresses the remaining concerns we discussed regarding the current status of groundwater at Kentec. If you need any additional information, please give me a call on (919) 522-6263.

Sincerely,

Jerry D. Henderson, Manager
N.C. Environmental Affairs

JDH/jkj
Enclosures

19.10106

KENTEC POND CLOSURE PLAN

RECEIVED
WASHINGTON OFFICE
APR 29 1993
D. E. M.

Water accumulated during construction of the groundwater interceptor trench has percolated into the bottom soil of the temporary holding pond. This pond is within the confines of the trench system so the percolated water is subject to capture and treatment when withdrawal begins in a few weeks. Since the pond now contains only rainwater, captured during seasonal rains, we would like to close the pond and restore the area to its original appearance. This will be accomplished by:

* Allowing the rainwater to percolate into the soil.

* Pushing the pond dikes into the empty reservoir.

* Compacting the earth to its original density and bringing the elevation up to the original natural ground elevation prior to the pond construction.

* Grading and reseeding the area with native grasses.

Jerry D. Henderson
Groundwater Manager
Kinston Plant

Kentec Groundwater Data
Water-Level Elevations
17 February 1993

(feet above mean sea level)

Monitoring Well	Elevation of Potentiometric Surface
MW1	27.17
MW3	27.12
MW4A	27.05
MW4B	24.77
MW6	25.61
MW7A	25.83
MW7B	24.92
MW8	27.08
MW9	27.18
MW10A	26.9
MW10B	23.92
MW11A	26.79
MW 11B	24.33
MW12	25.68
MW14A	22.46
MW14B	24.73
MW15	24.76
MW16	25.83
MW18	*

* The water level in MW18 was below the top of the pump

19.10106

State of North Carolina
Department of Environment, Health and Natural Resources
Northeastern Region
1424 Carolina Avenue, Washington, North Carolina 27889-1424

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Lorraine G. Shinn
Regional Manager

April 23, 1992

DIVISION OF ENVIRONMENTAL MANAGEMENT

E.I. Dupont De Nemours & Co.
Jerry D. Henderson, Groundwater Manager
P.O. Box 800
Kinston, NC 28502-800

SUBJECT: Kentec Pond
Closure Plan
Lenoir County

Dear Mr. Henderson:

This letter is written in response to your communication, on the subject plan received April 23, 1992. The proposal for closure of the pond used in the construction of the groundwater remediation projects is acceptable to the Washington Regional Office. Please notify the Region prior to beginning construction so a review of the pond might be made.

If I can be of any assistance as always my telephone number is 919/946-6481.

Sincerely,

ARHodge

Alton R. Hodge
Environmental Engineer

sle

P.O. Box 2188, Washington, North Carolina 27889-2188 Telephone 919-946-6481 FAX: 919-975-3716 / 919-946-6639

DU PONT
REG. U.S. PAT. & TM. OFF.
ESTABLISHED 1802

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
KINSTON PLANT
P.O. BOX 800
KINSTON, NORTH CAROLINA 28502-0800
PHONE (919) 522-6111

FIBERS DEPARTMENT

April 21, 1993

MR. GUY C. PEARCE
NC DEPARTMENT OF ENVIRONMENT,
HEALTH AND NATURAL RESOURCES
P. O. BOX 2188
WASHINGTON, NC 27889

Dear Mr. Pearce:

Thank you for your call today regarding the Kentec facility in Lenoir County. You raised several specific concerns that I will address in this memo.

First, you mentioned you had not received the second round of quarterly groundwater monitoring data from the Kentec Remediation Activity. Attached is this report, dated April 7, 1993, from our consultant. I was on vacation last week or would have mailed it sooner.

Second, you asked for water level measurements in the monitoring wells sampled as part of this round of sampling. I have requested this data from our consultant and will send it to you as soon as I get it.

Third, you mentioned you could not find a copy of the Kentec phase one report in your files. Attached is a copy of what we have called the phase one report. It is not labeled as "phase one", but it represents the initial investigatory work done at Kentec.

Fourth, there was a question as to the exact location of monitoring well #18. This well was installed as a part of the Kentec Corrective Action Plan. In the Kentec Corrective Action Plan, Section 5, Figure 5-1, this well is shown in the middle of the field east of the Kentec factory building. I have included a copy of this page from the C.A.P. for your information.

Finally, you requested copies of information regarding the installation and closure of the temporary holding pond constructed to contain water collected during the installation of the interceptor trench at the Kentec facility. This information will be sent to you within the next few days.

I believe this answers all the concerns you raised. If you have additional questions, please give me a call on (919) 522-6263.

Sincerely,

Jerry D. Henderson, Manager
N.C. Environmental Affairs

JDH/jkj

Attachments

472

MORANDUM

CH2MHILL

TO: Jerry Henderson/ Du Pont

FROM: Doug Dronfield/ CH2M HILL

DATE: April 7, 1993

SUBJECT: Kentec Quarterly Groundwater Data and Monthly Railcar Data

Enclosed are the quarterly groundwater monitoring data results (December 1992 through February 1993), the railcar concentrations, and monthly railcar average concentrations for the same time period (December 1992 through February 1993). The submittal of this data to the state complies with Section II.2. of the June 17, 1992 Groundwater Remediation Permit.

The railcar data (effluent from the groundwater treatment plant) are well within the limits established by in the permit (Section I.27).

Kentec Quarterly Groundwater Data
February 1993
All Concentrations are PPB

Well Number	Date	1,1-Dichloro-ethene	1,1-Dichloro-ethane	1,4-Dioxane
MW-1	2/93	< 7	< 7	200
MW-3	2/93	15	< 7	< 150
MW-4A	2/93	11	43	1100
MW-4B	2/93	< 7	< 7	< 150
MW-6	2/93	< 7	< 7	3600
MW-7A	2/93	41	< 7	3700
MW-7B	2/93	< 7	< 7	< 150
MW-8	2/93	< 7	< 7	< 150
MW-9	2/93	< 7	< 7	< 150
MW-10A	2/93	< 7	< 7	< 150
MW-10B	2/93	< 7	< 7	< 150
MW-11A	2/93	< 7	15	< 150
WM-11B	2/93	< 7	< 7	< 150
MW-12	2/93	< 7	< 7	< 150
MW-14A	2/93	< 7	< 7	260
MW-14B	2/93	< 7	< 7	< 150
MW-15	2/93	< 7	< 7	160
MW-16	2/93	< 7	< 7	< 150
MW-18	2/93	< 7	< 7	< 150
SW-11	2/93	< 7	8.7	< 150
SW-24	2/93	< 7	< 7	< 150
PS-2	2/93	< 7	15	< 150

Kentec Groundwater Treatment Facility
December, 1992 - March, 1993
Railcar

Identification Code	Date	Time	DCE (ppb)	DCA (ppb)	1,4 Dioxane (ppb)
	December				
Railcar 34063	2	700	<5	<5	<100
Railcar 94041	4	730	<5	<5	<100
Railcar 34064	10	730	<5	<5	<100
Railcar 94041	14	730	<5	<5	<100
Railcar 34064	18	715	<5	<5	<100
Railcar 34064	21	730	<5	<5	<100
Railcar 94041	23	700	<5	<5	<100
Railcar 34064	26	1000	<5	<5	<100
Railcar 94041	29	800	<5	<5	<100
Monthly Average			<5	<5	<100
	January				
Railcar 34064	1	715	<5	<5	<100
Railcar 94041	5	730	<5	<5	<100
Railcar 34064	8	730	<5	<5	<100
Railcar 94041	11	700	<5	<5	<100
Railcar 34064	14	730	5	<5	<100
Railcar 94041	18	730	<5	<5	<100
Railcar 34064	22	730	<5	<5	<100
Railcar 94041	25	730	<5	<5	<100
Railcar 34064	28	730	<5	<5	<100
Monthly Average			5	<5	<100
	February				
Railcar 94041	1	730	<5	<5	<100
Railcar 34064	3	730	<5	<5	<100
Railcar 94041	6	730	<5	<5	<100
Railcar 34064	9	700	<5	<5	<100
Railcar 94041	12	730	<5	<5	<100
Railcar 34064	15	730	<5	<5	<100
Railcar 94041	18	715	<5	<5	<100
Railcar 34064	22	730	<5	<5	<100
Railcar 94041	25	730	<5	<5	<100
Railcar 34064	28	745	<5	<5	<100
Monthly Average			<5	<5	<100

421

LAW OFFICES OF MARVIN BLOUNT, JR.
ATTORNEYS AT LAW
400 WEST FIRST STREET
P. O. DRAWER 58
GREENVILLE, NORTH CAROLINA
27835-0058

MARVIN BLOUNT, JR.
JOSEPH T. EDWARDS
JAMES F. HOPF
SHARRON R. EDWARDS

TELEPHONE (919) 752-6000
FAX (919) 752-2174

April 14, 1993

Mr. Willie Hardison
Groundwater Supervisor
North Carolina Department of Environment,
Health and Natural Resources
1424 Carolina Avenue
P.O. Box 2188
Washington, NC 27889

RE: Du Pont - Kentec site
Grifton, North Carolina

Dear Mr. Hardison:

Based on our recent review of your office's file concerning the above referenced site, we have certain concerns with Du Pont's failure to submit quarterly monitoring reports as part of the Corrective Action Plan and remediation system. Please advise why the State has elected not to require quarterly reports.

We hereby request that you follow up on this issue and require Du Pont to submit these reports and to account, in writing, for the lack of prior reports.

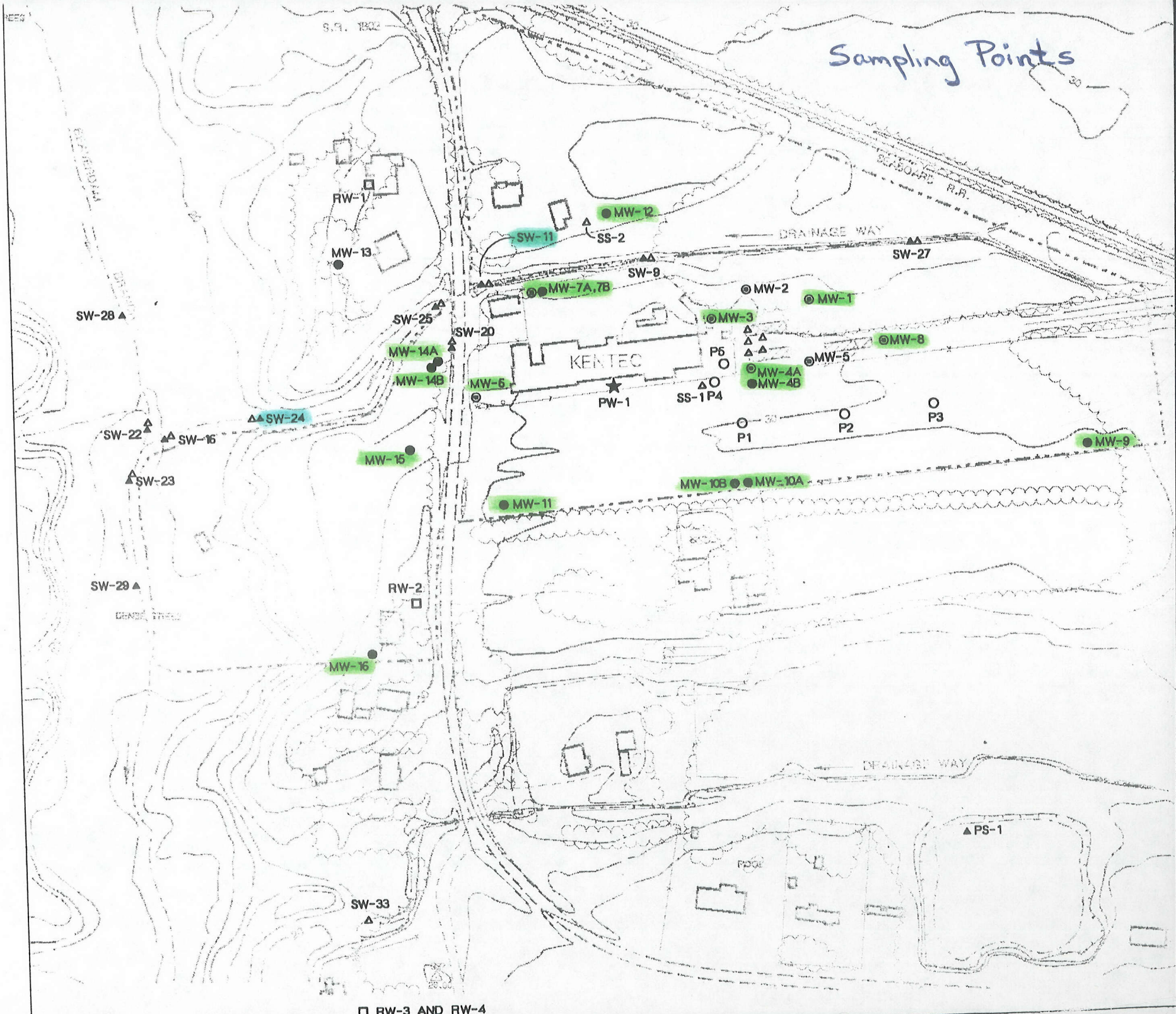
Thank you for your attention and cooperation in this matter. Should you have any questions, please do not hesitate to contact me.

Sincerely yours,

Marvin K. Blount, Jr.

Marvin K. Blount, Jr.

MBJr/cc


Sampling Points
RW-1
MW-13
SW-28
SW-25
SW-20
MW-14A
MW-14B
MW-6
SW-22
SW-16
SW-24
SW-23
MW-15
SW-29
RW-2
MW-16
SW-33
SW-11
SS-2
MW-12
SW-9
MW-7A,7B
SW-27
DRAINAGE WAY
MW-2
MW-1
MW-3
MW-8
MW-5
MW-4A
MW-4B
P5
KENTEC
PW-1
SS-1
P4
P1
P2
P3
MW-9
MW-10B
MW-10A
MW-11
PS-1
RW-3 AND RW-4

DUPONT

EXTERNAL AFFAIRS
150 Fayetteville Street Mall, Suite 2210
Raleigh, North Carolina 27601
Phone: (919) 834-8398
Fax: (919) 828-2707

March 31, 1993

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Guy C. Pearce
North Carolina Department of
Environment, Health and
Natural Resources
1424 Carolina Avenue
Post Office Box 2188
Washington, NC 27889

Re: E.I. du Pont de Nemours - Kentec Site
Lenoir County
Incident No. 6334

Dear Mr. Pearce:

Thank you for your letter of March 24, 1993. I understand that the Groundwater Section of the Division of Environmental Management is now asking Du Pont to proceed with certain offsite assessment activities specified in a letter you sent me on May 8, 1991.

As you are aware, we advised the Division in May of 1991 that we were unable to conduct offsite testing at that time because the owners of neighboring properties had retained counsel and denied us access to the properties. Now that their lawyer has recently notified you of their change in position, Du Pont will be glad to revisit this matter.

There have been a number of developments since we last discussed offsite assessment. The most significant has been the design, installation, and operation of a comprehensive onsite remediation system. Since we believe that system has significantly affected groundwater flow patterns, our consultants must re-evaluate the offsite assessment we were considering in 1991. They have already begun doing so.

In addition, a federal judge has ordered the neighbors who are suing Du Pont to conclude their groundwater testing of their own properties by May 31, 1993, and to provide Du Pont with all testing data by June 15, 1993. (Du Pont's Lawyer, Jonathan D. Sasser, sent you a copy of this Case Management Order ("CMO") on March 8, 1993.) (See CMO ¶ 3) It would make sense for our

consultants to evaluate this data before determining whether the offsite assessment we were considering in 1991 should be revised.

Incidentally, this same federal order also requires Du Pont to conduct any groundwater testing of the neighbors' properties from July 1, 1993 through September 30, 1993, and to file an expert's affidavit by October 15, 1993 indicating the extent, if any, of contamination. Thus, the timetable contemplated in your March 24, 1993 letter could subject some neighboring properties to three separate sets of testing: (1) By Du Pont from now until May 25, 1993 pursuant to your direction; (2) By the neighbors from now until May 31, 1993 pursuant to the federal order; and (3) By Du Pont from July 1, 1993 through September 30, 1993 pursuant to the federal order.

It would be efficient, economical, and convenient for all concerned if Du Pont could pursue both testing programs simultaneously. Du Pont therefore suggests that we submit an offsite assessment proposal by June 30, 1993. Offsite testing pursuant to such a plan would take place from July 1, 1993 through September 30, 1993, and we will advise you of the results by October 15, 1993. This timetable corresponds identically with Du Pont's obligations under the federal order.

As you know, none of the neighbors are using the groundwater, and certainly none of them are currently drinking water from neighborhood wells. You may recall that all neighbors who had not previously been using North Lenoir Community Water were connected to that utility in 1991 at Du Pont's expense.

We will be glad to meet with you to discuss this proposal. Thank you for staying in touch with us. Please do not hesitate to call on me if I can be of any further assistance.

Sincerely,

Jerry D. Henderson

Manager, North Carolina
Environmental Affairs

GW/GP P 262 887 723

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Special Delivery Fee	
Restricted Delivery Fee	
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Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$ 2.75
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PS Form **3800**, June 1991

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SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Jerry D. Henderson
E.I. DuPont Co., Inc.
P.O. Box 800
Kinston NC 28502

4a. Article Number
P 262 887 723

4b. Service Type
☐ Registered ☐ Insured
☑ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)
Marcia Kung

PS Form **3811**, December 1991 GPO: U.S. GPO: 1992—323-402 **DOMESTIC RETURN RECEIPT**

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GW/GCP

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Department of EHNR
P. O. Box 2188
Washington, North Carolina 27889

WaRO

State of North Carolina
Department of Environment, Health and Natural Resources
Northeastern Region
1424 Carolina Avenue, Washington, North Carolina 27889-1424
James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary

DIVISION OF ENVIRONMENTAL MANAGEMENT
GROUNDWATER SECTION

March 24, 1993

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Jerry D. Henderson
E.I. Du Pont de Nemours & Co., Inc.
Post Office Box 800
Kinston, North Carolina 28502

Re: DuPont-Kentec Facility
Lenoir County
Incident No. 6334

Dear Mr. Henderson:

As we discussed in our telephone conversation on Monday, March 22, 1993, our office has recently received information from Mr. Marvin Blount, an attorney representing the property owners in proximity to the referenced site, which indicates that DuPont-Kentec has been granted access to their properties for the purpose of assessing the extent and degree of ground water contamination. For your convenience, I have attached a copy of the letter, dated February 24, 1993, from Mr. Marvin Blount to Mr. Jonathan D. Sasser, of Moore and Van Allen.

Based on this information, the Division is requesting DuPont-Kentec to move forward with offsite assessment activities as specified in our letter to you, dated May 8, 1991 (copy attached). The results of the assessment should be submitted to our office for review within sixty (60) days of receipt of this letter.

Please be advised that well construction permits will be required for monitor wells constructed off the DuPont-Kentec

property. For your convenience, I have attached several monitoring well construction permit applications.

If you have any questions, or wish to discuss this matter further, please contact me at any time.

Sincerely,

Guy C. Pearce

Guy C. Pearce
Hydrogeologist I

cc: WaRO Files ✔

File Copy

State of North Carolina
Department of Environment, Health and Natural Resources
Northeastern Region
1424 Carolina Avenue, Washington, North Carolina 27889

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Lorraine G. Shinn
Regional Manager

DIVISION OF ENVIRONMENTAL MANAGEMENT

May 8 1991

Mr. Jerry D. Henderson
E.I. DuPont de Nemours and Company, Inc.
Post Office Box 800
Kinston, North Carolina 28501

Re: Groundwater Assessment
DuPont-Kentec Facility
Kinston, North Carolina

Dear Mr. Henderson:

On April 19, 1991, a meeting was held in the Washington Regional Office among members of your staff, and the Division of Environmental Management-Groundwater Section to discuss issues relating to the above referenced subject. Based on that meeting and the submitted report entitled, "Kentec Groundwater Assessment" dated April 1991, the Groundwater Section makes the following comments:

1. As stated in the report and discussed during the meeting, the extent and degree of groundwater contamination beyond the property boundaries of the facility to the south and east has not been fully defined. The assessment cannot be considered complete until the horizontal extent of the contaminant plume has been delineated.

2. Insufficient data has been presented to determine if the deeper, confined, Peedee aquifer has been impacted. The assessment cannot be considered complete until the vertical extent of the contaminant plume has been determined.

The Groundwater Section requests that DuPont-Kentec perform all work necessary to fully define the contaminant plume. This information should be submitted to our office within sixty (60) days of receipt of this letter.

3. As we indicated to you at the meeting, we do not object to DuPont-Kentec moving forward with on-site remediation. A conceptual Remedial Action Plan should be submitted to our office within fifteen (15) days of receipt of this letter. Please be advised that modifications to the proposed plan may become necessary as additional data concerning the horizontal and vertical components of the contaminant plume becomes available.

If you have any questions or wish to discuss this matter further, please contact me at any time. I can be reached at (919) 946-6481.

Sincerely,

Guy C. Pearce

Guy C. Pearce
Hydrogeological Technician

GCP:ekw

cc: Jim Mulligan
Willie Hardison

LAW OFFICES OF MARVIN BLOUNT, JR.
ATTORNEYS AT LAW
400 WEST FIRST STREET
P. O. DRAWER 58
GREENVILLE, NORTH CAROLINA
27835-0058

MARVIN BLOUNT, JR.
JOSEPH T. EDWARDS
JAMES F. HOPF
SHARRON R. EDWARDS

TELEPHONE (919) 752-6000
FAX (919) 752-2174

March 19, 1993

Mr. Willie Hardison
State of North Carolina
Division of Environmental Management
Groundwater Section
1424 Carolina Avenue
Washington, NC 27889-1424

RE: Edward B. Grant, et al vs. Du Pont

Dear Mr. Hardison

Please find enclosed a copy of a letter which was sent to the attorneys for Du Pont on February 24, 1993. I was advised today by Guy Pearce that your office was unaware that Du Pont has unlimited access to our clients' property in and around the Kentec facility for the purpose of sampling, monitoring and testing the nature and extent of contamination from the Kentec facility. Mr. Pearce advised us that we should notify your office in writing of this fact so that there would be no question arising from Du Pont as to whether in fact access was available to the properties for testing.

Are you aware that Du Pont has had unlimited access to the property of Charles Braxton throughout the past several years for the purpose of testing to determine the extent and nature of the contamination to his property? This may be something you would want to inquire about with Du Pont.

Please advise if you need any additional information. We are hopeful that Du Pont will proceed immediately to sufficiently define the area and extent of contamination.

With warmest personal regards,

Sincerely yours,

Marvin K. Blount, Jr.

MBJr/cc

Enclosure

LAW OFFICES OF MARVIN BLOUNT, JR.
ATTORNEYS AT LAW
400 WEST FIRST STREET
P. O. DRAWER 58
GREENVILLE, NORTH CAROLINA
27835-0058

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SHARRON R. EDWARDS

TELEPHONE (919) 752-6000
FAX (919) 752-2174

February 24, 1993

CERTIFIED MAIL

Jonathan D. Sasser, Esquire
Moore & Van Allen
Post Office Box 26507
Raleigh, NC 27611

RE: Edward B. Grant and wife, Janice G. Grant, et al., v. E. I. du Pont de Nemours and Company, Incorporated, Case Nos. 91-55-CIV-4-H through 91-62-CIV-4-H and 91-136-CIV-4-H through 91-139-CIV-4-H (Consolidated)

Dear Jon:

Throughout proceedings in these actions, you and your client have repeatedly raised an issue concerning the testing of the Plaintiffs' properties and the supposed refusal of the Plaintiffs to allow Du Pont access for the purpose of testing. Needless to say, there are two sides to every story and the Plaintiffs do not believe Du Pont has ever offered to test their properties in a reasonable and fair manner and, in fact, Du Pont has refused to provide independent sampling of these properties.

In any event, at this time, and so there will be no questions in the future, the plaintiffs hereby advise you that their properties are open for any sampling, monitoring and testing that Du Pont wishes to perform in order to fully and accurately define the nature and extent of contamination from the Facility. Please advise us when Du Pont will begin testing the Plaintiffs' properties so that we can keep our clients advised.

Sincerely yours,

Marvin

Marvin K. Blount, Jr.

MBJr/cc

State of North Carolina
Department of Environment, Health and Natural Resources
Northeastern Region
1424 Carolina Avenue, Washington, North Carolina 27889-1424
James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary

DIVISION OF ENVIRONMENTAL MANAGEMENT

Groundwater Section

TO WHOM IT MAY CONCERN:

Under the Freedom of Information Act, I hereby request access to the Groundwater files (# 6334 (DuPont-Kentec Site)). I make this request on behalf of and as an agent of LAW OFFICES of MARVIN BLOUNT. Thank you for your cooperation.

Signed: Marvin Blount Date: 3/19/93

(Address)

Phone: 919-752-6000

LAW OFFICES OF MARVIN BLOUNT, JR.
ATTORNEYS AT LAW
400 WEST FIRST STREET
P. O. DRAWER 58
GREENVILLE, NORTH CAROLINA
27835-0058

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SHARRON R. EDWARDS

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March 19, 1993

Mr. Willie Hardison
State of North Carolina
Division of Environmental Management
Groundwater Section
1424 Carolina Avenue
Washington, NC 27889-1424

RE: Edward B. Grant, et al vs. Du Pont

Dear Mr. Hardison

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Are you aware that Du Pont has had unlimited access to the property of Charles Braxton throughout the past several years for the purpose of testing to determine the extent and nature of the contamination to his property? This may be something you would want to inquire about with Du Pont.

Please advise if you need any additional information. We are hopeful that Du Pont will proceed immediately to sufficiently define the area and extent of contamination.

With warmest personal regards,

Sincerely yours,

Marvin K. Blount, Jr.

MBJr/cc

Enclosure

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MARVIN BLOUNT, JR.
JOSEPH T. EDWARDS
JAMES F. HOPF
SHARRON R. EDWARDS

February 24, 1993

CERTIFIED MAIL

Jonathan D. Sasser, Esquire
Moore & Van Allen
Post Office Box 26507
Raleigh, NC 27611

RE: Edward B. Grant and wife, Janice G. Grant, et al., v. E. I. du Pont de Nemours and Company, Incorporated, Case Nos. 91-55-CIV-4-H through 91-62-CIV-4-H and 91-136-CIV-4-H through 91-139-CIV-4-H (Consolidated)

Dear Jon:

Throughout proceedings in these actions, you and your client have repeatedly raised an issue concerning the testing of the Plaintiffs' properties and the supposed refusal of the Plaintiffs to allow Du Pont access for the purpose of testing. Needless to say, there are two sides to every story and the Plaintiffs do not believe Du Pont has ever offered to test their properties in a reasonable and fair manner and, in fact, Du Pont has refused to provide independent sampling of these properties.

In any event, at this time, and so there will be no questions in the future, the plaintiffs hereby advise you that their properties are open for any sampling, monitoring and testing that Du Pont wishes to perform in order to fully and accurately define the nature and extent of contamination from the Facility. Please advise us when Du Pont will begin testing the Plaintiffs' properties so that we can keep our clients advised.

Sincerely yours,

Marvin

Marvin K. Blount, Jr.

MBJr/cc

State of North Carolina
Department of Environment, Health and Natural Resources
Division of Environmental Management
512 North Salisbury Street • Raleigh, North Carolina 27611

James B. Hunt, Jr., Governor

Jonathan B. Howes, Secretary

March 15, 1993

Mr. R. D. Ferguson, Plant Manager
E. I. DuPont De Nemours & Co., Inc.
Post Office Box 800
Kinston, N.C. 28502

Subject: Permit No. WQ0005906
E. I. DuPont De Nemours & Co., Inc.
Kentec Site, SIC Code No. 7399
Groundwater Remediation System
Lenoir County

Dear Mr. Ferguson:

In accordance with your amendment request received January 19, 1993, we are forwarding herewith Permit No. WQ0005906 as amended, dated March 15, 1993, to E. I. DuPont De Nemours & Co., Inc. for the continued operation of the subject facility. This amendment was requested to incorporate the Corrective Action Plan (CAP) language back into the Groundwater Conditions.

This permit shall void Permit No. WQ0005906 issued December 9, 1992, shall be effective from the date of issuance until November 30, 1997 and shall be subject to the conditions and limitations as specified therein. Please pay particular attention to the monitoring requirements in this permit. Failure to establish an adequate system for collecting and maintaining the required operational information will result in future compliance problems.

If any parts, requirements, or limitations contained in this permit are unacceptable to you, you have the right to request an adjudicatory hearing upon written request within 30 days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of North Carolina General Statutes, and filed with the Office of Administrative Hearings, P.O. Drawer 27447, Raleigh, NC 27611-7447. Unless such demands are made this permit shall be final and binding.

If you need additional information concerning this matter, please contact Mr. Michael D. Allen at (919) 733-5083.

Sincerely,

Carolyn D. McCaskill for

A. Preston Howard, Jr., P.E.
Director

cc: Lenoir County Health Department
Washington Regional Office, Water Quality
Washington Regional Office, Groundwater
Groundwater Section, Central Office
Facilities Assessment Unit
Training and Certification

NORTH CAROLINA

ENVIRONMENTAL MANAGEMENT COMMISSION

DEPARTMENT OF ENVIRONMENT, HEALTH AND NATURAL RESOURCES

RALEIGH

GROUNDWATER REMEDIATION PERMIT

In accordance with the provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules, and Regulations

PERMISSION IS HEREBY GRANTED TO

E. I. DuPont De Nemours & Co., Inc.

Lenoir County

FOR THE

continued operation of a 7,200 GPD groundwater remediation system with 2,000 GPD being reused in the E. I. DuPont De Nemours & Co., Inc.'s Kentec Facility and the remaining flow being collected into a 20,000 gallon railcar and being transported to the E. I. DuPont De Nemours & Co., Inc.'s Kinston Wastewater Treatment Facility (NPDES Permit No. NC0003760) consisting of approximately 2,605 linear feet of 6-inch perforated groundwater interceptor piping, two (2) simplex pump stations equipped with Myers 1-HP Model WE1012H pumps and high water alarms, a 600 gallon surge/pretreatment tank, a Ultrox F-325 UV/oxidation reactor with a 14 pound ozone generator and peroxide feed with Ultraviolet light, two (2) 165-pound granular activated carbon canisters, a 16,000 gallon holding tank, associated piping, valves and appurtenances to serve E. I. DuPont De Nemours & Co., Inc.'s Kentec Site with no discharge of wastes to the surface waters, pursuant to the amendment request received January 19, 1993, and in conformity with the project plan, specifications, and other supporting data subsequently filed and approved by the Department of Environment, Health and Natural Resources and considered a part of this permit.

This permit shall void Permit No. WQ0005906 issued December 9, 1992, shall be effective from the date of issuance until November 30, 1997 and shall be subject to the following specified conditions and limitations:

I. General Conditions

1. This permit shall become voidable unless the subject pump and haul activities are carried out in a manner which has been approved by this Division.

2. This permit is effective only with respect to the nature and volume of wastes described in the application and other supporting data.

3. The facilities shall be properly maintained and operated at all times.

4. This permit is not transferable. In the event there is a desire for the facilities to change ownership, or there is a name change of the Permittee, a formal permit request must be submitted to the Division of Environmental Management accompanied by an application fee, documentation from the parties involved, and other supporting materials as may be appropriate. The approval of this request will be considered on its merits and may or may not be approved.

5. No type of wastewater other than that from E. I. DuPont De Nemours & Co., Inc.'s Kentec's groundwater remediation shall be included in the pump and haul activities.

6. The permit shall become voidable unless the agreement between E. I. DuPont De Nemours & Co., Inc. and CSX Transportation or Conoco Transportation for the transportation of the treated groundwater is in full force and effect.

7. In the event that the facilities fail to perform satisfactorily, including the creation of nuisance conditions, the Permittee shall cease operation of all pump and haul activities and take such immediate corrective action, as may be required by this Division.

8. The groundwater collected by this system shall be treated in the E. I. DuPont De Nemours & Co., Inc.'s Kinston Wastewater Treatment Plant (NPDES Permit No.NC0003760) prior to being discharged into the receiving stream.

9. The remediated groundwater from the E. I. DuPont De Nemours & Co., Inc.'s Kentec site will be accumulated in a 20,000 gallon railcar, sampled and analyzed in accordance with Item I.27 of this permit and introduced into the E. I. DuPont De Nemours & Co., Inc.'s Kinston Wastewater Treatment Plant prior to any primary treatment components such the remediated groundwater is conveyed through the entire treatment train. The introduction rate shall not exceed 20,000 gallons in a 24-hour day.

10. The Washington Regional Office, telephone no. (919) 946-6481, shall be notified at least forty-eight (48) hours in advance of operation of the pump and haul activities so that an in-place inspection can be made. Such notification to the regional supervisor shall be made during the normal office hours from 8:00 a.m. until 5:00 p.m. on Monday through Friday, excluding State Holidays.

11. The Permittee is liable for any damages caused by a spill or failure of the pump and haul operations.

12. Adequate inspection, maintenance, and cleaning shall be provided by the Permittee to insure proper operation of the subject facilities.

13. The Permittee or his designee shall inspect the groundwater remediation and collection facilities to prevent malfunctions and deterioration, operator errors and discharges which may cause or lead to the release of wastes to the environment, a threat to human health, or a nuisance. The Permittee shall keep an inspection log or summary including at least the date and time of inspection, observations made, and any maintenance, repairs, or corrective actions taken by the Permittee. This log of inspections shall be maintained by the Permittee for as long as the pump and haul activities are being conducted and shall be made available upon request to the Division of Environmental Management or other permitting authority.

14. Any duly authorized officer, employee, or representative of the Division of Environmental Management may, upon presentation of credentials, enter and inspect any property, premises or place on or related to the groundwater remediation and collection facilities at any reasonable time for the purpose of determining compliance with this permit; may inspect or copy any records that must be kept under the terms and conditions of this permit; and may obtain samples.

15. An accurate record of the pump and haul activities must be maintained by the Permittee, indicating:

a) date groundwater is removed from the facility,
b) name of facility from which groundwater is removed,
c) name of facility receiving groundwater, and
d) volume of groundwater removed,
e) status of permanent disposal option.

These records shall be submitted to the Washington Regional Office of the Division of Environmental Management on or before the fifteenth (15) day of the following month.

16. Failure to abide by the conditions and limitations contained in this permit may subject the Permittee to an enforcement action by the Division of Environmental Management in accordance with North Carolina General Statute 143-215.6A to 143-215.6C.

17. The issuance of this permit does not preclude the Permittee from complying with any and all statutes, rules, regulations, or ordinances which may be imposed by other government agencies (local, state, and federal) which have jurisdiction.

18. The Permittee shall provide for the installation and maintenance of an audible and visual highwater alarm.

19. A copy of the approved plans and specifications shall be maintained on file by the Permittee for the life of the project.

20. **Noncompliance Notification:**

The Permittee shall report by telephone to the Washington Regional Office, at telephone no. (919) 946-6481, as soon as possible, but in no case more than 24 hours or on the next working day following the occurrence or first knowledge of the occurrence of any of the following:

a. Any process unit failure, due to known or unknown reasons, that render the facility incapable of adequate wastewater treatment such as mechanical or electrical failures of pumps, aerators, compressors, etc.

b. Any failure of a pumping station, sewer line, etc. resulting in a by-pass directly to receiving waters without treatment of all or any portion of the influent to such station or facility.

Persons reporting such occurrences by telephone shall also file a written report in letter form within 15 days following first knowledge of the occurrence. This report must outline the actions taken or proposed to be taken to ensure that the problem does not recur.

21. The annual administering and compliance fee must be paid by the Permittee within thirty (30) days after being billed by the Division. Failure to pay the fee accordingly may cause the Division to initiate action to revoke this permit as specified by 15 NCAC 2H .0205 (c)(4).

22. Each railcar shall be sampled for the following parameters:

Parameter	Monthly Average Railcar or Tanker Concentration*	Railcar or Tanker Concentration*
1,1-Dichloroethane (DCA)	14 ug/liter	21 ug/liter
1,1-Dichloroethylene (DCE)	14 ug/liter	21 ug/liter
1,4-Dioxane	200 ug/liter	300 ug/liter

* The following concentrations were determined from the Treatablilty Study outlined in the "Kentec Corrective Action Plan", July 11, 1991, prepared by CH2M Hill for E. I. DuPont De Nemours & Co., Inc.:

1,1-Dichloroethane (DCA)	7 ug/liter
1,1-Dichloroethylene (DCE)	7 ug/liter
1,4-Dioxane	100 ug/liter

23. The Permittee, at least six (6) months prior to the expiration of this permit, shall request its extension. Upon receipt of the request, the Commission will review the adequacy of the facilities described therein, and if warranted, will extend the permit for such period of time and under such conditions and limitations as it may deem appropriate.

24. This permit may be modified, or revoked and reissued to incorporate any conditions, limitations and monitoring requirements the Division of Environmental Management deems necessary in order to adequately protect the environment and public health.

II. Groundwater Compliance Schedule

1. Dupont shall submit all progress reports and data required by the Division established under the provisions of this permit and/or implementation of the Remedial Action Study (RAS). The reports shall be submitted to the Washington Regional Office on a quarterly basis, which will begin with the first day of the month following the month the RAS was placed into operation.

2. Dupont shall properly operate and maintain the facility so as to minimize the impact of groundwater contamination.

3. DuPont agrees that this permit shall pertain only to the source and property identified as the Kentec site located in Lenoir County which is owned by DuPont. Unless an applicable Special Order or permit has been issued by the Commission, violations of groundwater standards resulting from additional sources for which DuPont is responsible may subject DuPont to all sanctions provided by N.C. General Statutes §§ 143-215.2 and 143-215.6.

4. Pursuant to the terms of the Corrective Action Plan (CAP), DuPont will construct a groundwater interceptor trench (GIT) to prevent migration off-site within the superficial aquifer of dioxane, DCE and DCA. Water collected in the GIT will be collected, treated and disposed of pursuant to the terms of this permit and the CAP as approved by any superseding NPDES Permit or any other permit issued by the Commission subsequent to the date of this permit. Collection, treatment and disposal of treated water from the GIT shall be continued until the groundwater collection in the GIT reached the target clean-up levels specified in the approved CAP.

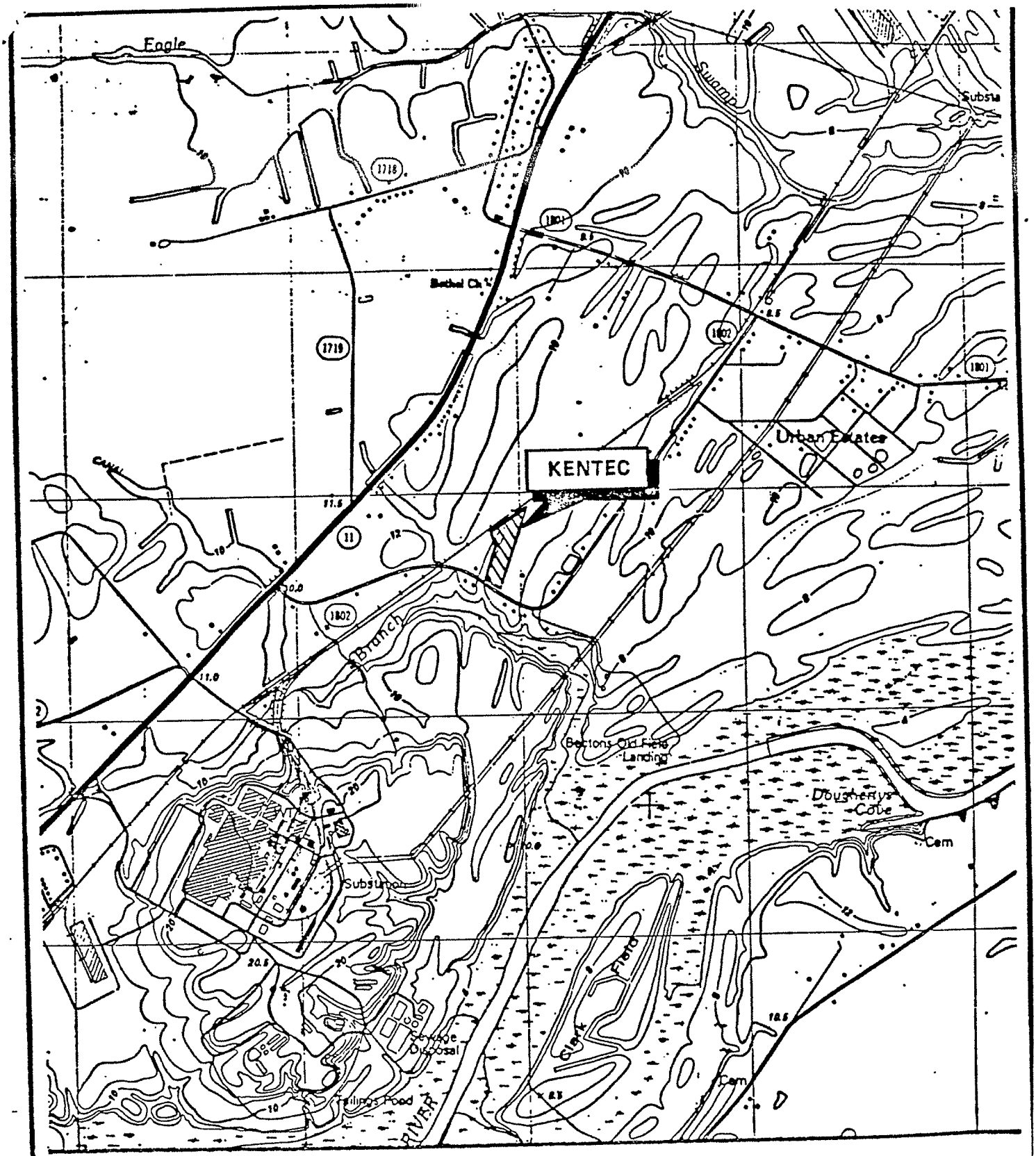
Permit issued this the 15th day of March, 1993

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

Carolyn W. McCaskill /for

A. Preston Howard, Jr., P.E., Director
Division of Environmental Management
By Authority of the Environmental Management Commission

Permit No WQ0005906



LEGEND

Source: USGS Grifton Quadrangle
North Carolina, 1983
Contour Interval – 2 Meters

SCALE:

1000 0 1000

1/2 inch equals 1000 feet

-N-

Figure 1
KENTEC SITE LOCATION

MOORE & VAN ALLEN
ATTORNEYS AT LAW
ONE HANNOVER SQUARE
SUITE 1700
POST OFFICE BOX 26507
RALEIGH, NORTH CAROLINA 27611
TELEPHONE (919) 828-4481

JONATHAN D. SASSER
PARTNER
DIRECT DIAL: (919) 821-6290

OTHER OFFICES:
CHARLOTTE, N. C.
DURHAM, N. C.
TELEFAX (919) 828-4254

March 8, 1993

Mr. Guy Pearce
North Carolina Department of
Environment, Health and
Natural Resources
1424 Carolina Avenue
Post Office Box 2188
Washington, NC 27889

Re: E.I. du Pont de Nemours - Kentec Site

Dear Mr. Pearce:

Thank you for your inquiry regarding the Kentec site. I write to confirm that Du Pont has provided your department with all known maps depicting groundwater contamination at that location.

As you may know, owners of neighboring properties have brought a $1.3 billion federal litigation against Du Pont. Pursuant to a Case Management Order entered in that case, the plaintiffs and Du Pont may be conducting extensive groundwater testing in the vicinity of Kentec over the next several months. Du Pont will provide you with any results of its investigation, as we assume will the plaintiffs.

For your information, I enclose a copy of the Case Management Order. Please let me know whether I can be of any further assistance.

Sincerely,

MOORE & VAN ALLEN

Jonathan D. Sasser

Jonathan D. Sasser

RAL_2\G:\DOCS\JDS\LETTER\9865_1

State of North Carolina
Department of Environment, Health and Natural Resources
Northeastern Region
1424 Carolina Avenue, Washington, North Carolina 27889-1424
James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary

DIVISION OF ENVIRONMENTAL MANAGEMENT
GROUNDWATER SECTION

March 4, 1993

Mr. Marvin Blount, Jr. - Attorney
400 West First Street
Greenville, North Carolina 27853-0058

SUBJECT: Request for Information
Du Pont - Kentec Facility
Lenoir County

Dear Mr. Blount:

In response to your letter, dated March 2, 1993, and our telephone conversation(s) on Thursday, March 4, 1993, I have reviewed the subject file to determine if a map illustrating estimated extent of off-site groundwater contamination had been submitted to the Division. Based on that review, it does not appear such a map has been received by our office. A possible explanation for the lack of this type of map could be a lack of sufficient data concerning off-site groundwater contaminant concentrations. I have contacted Du Pont and requested that if a map of this kind has been generated, to submit a copy to the Division.

As we discussed, the Division does possess a map which shows the results of groundwater sampling/analysis for the monitoring wells, both on and off-site, that have been constructed and sampled by Du Pont to date. While this map does not attempt to approximate the extent of groundwater contamination, it may still provide useful information which could be used to make predictions concerning the extent of groundwater contamination. Verification, through actual groundwater sampling, would be necessary to support any predictions made.

Please be advised that the Division's incident file for

P.O. Box 2188, Washington, North Carolina 27889-2188 Telephone 919-946-6481 FAX: 919-975-3716 / 919-946-6639

this site is available for your review at the Washington Regional Office. If you so desire, please contact Mr. Willie Hardison, Groundwater Supervisor for the Washington Regional Office, to arrange a mutually agreeable date and time.

Sincerely,

Guy C. Pearce
Hydrogeologist I

cc: WaRO Files

LAW OFFICES OF MARVIN BLOUNT, JR.
ATTORNEYS AT LAW
400 WEST FIRST STREET
P. O. DRAWER 58
GREENVILLE, NORTH CAROLINA
27835-0058

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JOSEPH T. EDWARDS
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SHARRON R. EDWARDS

TELEPHONE (919) 752-6000
FAX (919) 752-2174

March 2, 1993

Mr. Willie Hardison
Groundwater Supervisor
North Carolina Department of Environment,
Health and Natural Resources
1424 Carolina Avenue
P.O. Box 2188
Washington, NC 27889

Re: Du Pont-Kentec site
Grifton, North Carolina
(Lenoir County)

Dear Mr. Hardison:

I attempted to reach you by telephone but was unsuccessful as I was advised that you were in a meeting. The purpose of my call was to inquire as to the existence in the DEM files of a map detailing the plume of groundwater contamination at the above referenced Du Pont site in Lenoir County. It is our information that such a plume map was produced by Du Pont for this site and I am requesting a copy. If no such map is on file in your office, I would like to know why such a map would not have been filed with the DEM.

Thank you in advance for your assistance on this matter. After you have had an opportunity to check into this, please give me a call to discuss this map or why no such map is on record at the DEM.

Sincerely yours,

Marvin Blount, Jr.

Marvin Blount, Jr.

MBJ/pr

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF NORTH CAROLINA
NEW BERN DIVISION

CIVIL ACTION NO. 91-55-CIV-4-H

FILED IN ALL PENDING DU PONT LITIGATION

EDWARD B. GRANT and wife, JANICE C. GRANT,

Plaintiffs,

v.

E.I. DU PONT DE NEMOURS AND COMPANY, INCORPORATED,

Defendant

CASE MANAGEMENT ORDER

This litigation involves twelve separate civil actions brought against E.I. du Pont de Nemours ("Du Pont") by twenty-two residents of Lenoir County, who allege that Du Pont has contaminated their homes and personally injured them through the release of certain chemicals into the air and groundwater. The total amount in controversy, including punitive damages claims of $500 million, exceeds $1.3 billion.

By orders dated August 26, 1991 and January 21, 1992, former Magistrate Judge Leonard consolidated these actions for discovery purposes only. By order dated February 19, 1992, Judge Leonard directed the parties to conduct two weeks of depositions per month for a period of eight months. By order dated July 24, 1992, this Court directed the parties to continue adhering to this schedule, and to propose a revised scheduling and case management order on November 1, 1992. By consent order dated

November 4, 1992, this Court postponed until December 15, 1992 the time for the parties to do so.

The Court notes that, since this litigation was commenced on May 7, 1991, Plaintiffs have taken twenty-one depositions, and Du Pont has deposed twenty-five witnesses, including twenty-one of the twenty-two Plaintiffs. Plaintiffs have served six sets of interrogatories and four sets of requests for admission, and Du Pont has served two sets of interrogatories and two sets of requests for admission. The Court further notes that both parties are still well within the parameters established for such discovery methods in Judge Leonard's orders of August 26, 1991 and January 21, 1992. For example, although Judge Leonard's August 26, 1991 order permits Du Pont to take 40 depositions of witnesses other than experts and the Plaintiffs themselves, Du Pont has thus far taken four such depositions.

CKM J. However, the Court also finds that, despite District Judge Howard's admonition that "[t]he contamination of the plaintiffs' properties is the central issue in this litigation,"[1] Plaintiffs admit that ten of the twelve properties at issue in these cases still have not been tested for the existence of such potential contamination. Said another way, eighteen of the twenty-two Plaintiffs have not yet tested their properties. Moreover, not one Plaintiff has consulted a doctor regarding Plaintiffs' alleged exposure to "ultrahazardous" chemicals or Plaintiffs' alleged increased possibility of future illness.

[1] Order, Stancill v. Du Pont and Jones v. Du Pont, Nos. 91-57-CIV-4-H, 91-60-CIV-4-H (E.D.N.C. Sept. 9, 1992) (Howard, J.).

In light of the magnitude of this litigation ~~and the potential for unnecessary proceedings~~, the Court finds that entry of the following case management order is appropriate:

1. The parties are to continue deposition discovery of fact witnesses through June 30, 1993. Depositions are to proceed on the same schedule envisioned in Judge Leonard's order of February 19, 1992.

2. Expert discovery shall take place on the following schedule:

(a) On or before the following dates, Plaintiffs are to file with the Court and provide Du Pont with the names and addresses of all expert witnesses Plaintiffs expect to call at trial regarding the subject matters of the following paragraphs of this order, along with statements of the substance of the facts and opinions to which such experts are expected to testify, and a summary of the grounds for each such opinion:

(i) Paragraph 3 -- June 15, 1993.

(ii) Paragraph 5 -- May 15, 1993.

(iii) Paragraph 7 -- August 15, 1993.

(iv) Paragraph 9 -- June 15, 1993.

(v) Paragraph 11 -- July 15, 1993.

Du Pont shall have two months following each such deadline set forth above to conduct depositions of the identified expert witnesses.

(b) On or before the following dates, Du Pont is to file with the Court and provide Plaintiffs with the names and addresses of all expert witnesses Du Pont expects to call at trial regarding the subject matters of the following paragraphs

of this order, along with statements of the substance of the facts and opinions to which such experts are expected to testify, and a summary of the grounds for each such opinion:

(i) Paragraph 4 -- October 15, 1993.

(ii) Paragraph 6 -- August 15, 1993.

(iii) Paragraph 8 -- November 15, 1993.

(iv) Paragraph 10 -- October 15, 1993.

(v) Paragraph 12 -- October 15, 1993.

Plaintiffs shall have two months following each such deadline set forth above to conduct depositions of the identified expert witnesses.

3. Plaintiffs are to complete the scientific testing of their properties, including soil, groundwater, surfacewater, and air, by May 31, 1993. On or before June 15, 1993, Plaintiffs are to provide Du Pont with all testing results, analyses and other data, and file with the Court and provide Du Pont with the affidavit of a competent expert witness, specifying the nature, duration, and level of contamination of each Plaintiff's property. The expert's affidavit must specify each chemical substance by name, the date of testing, the level and concentration of the substance detected as of the testing date, the testing methodology, the detection limits of the methodology, the connection of the chemical to Kentec Inc. and Du Pont, and the path and route of the chemical from Kentec to the Plaintiff's property. The failure of any Plaintiff to comply with this paragraph may result in his or her action being dismissed.

4. Du Pont shall have from July 1, 1993 through September 30, 1993 to complete its scientific testing of the properties,

including soil, groundwater, surfacewater, and air, of all Plaintiffs who have demonstrated their interest in continuing in this litigation by their compliance with the preceding paragraph. The failure of any Plaintiff to cooperate with Du Pont's efforts to comply with this paragraph may result in his or her action being dismissed. On or before October 15, 1993, Du Pont shall provide Plaintiffs with all testing results, analyses and other data, and file with the Court and provide Plaintiffs with the affidavit of a competent expert witness, stating whether each such Plaintiff's property is contaminated, and specifying the nature, duration, and level of contamination of any contaminated property. The expert's affidavit must specify each chemical substance by name, the date of testing, the level and concentration of the substance detected as of the testing date, the testing methodology, the detection limits of the methodology, whether the chemical is connected to Kentec Inc. and Du Pont, and, if so, the path and route of the chemical from Kentec to the Plaintiff's property. The failure of Du Pont to comply with this paragraph may result in its being precluded from introducing evidence on this issue at trial.

5. Plaintiffs are to complete all appraisals of their properties by April 30, 1993. On or before May 15, 1993, Plaintiffs are to provide Du Pont with all such appraisals, and file with the Court and provide Du Pont with the affidavit of a qualified real estate appraiser, specifying the value of each Plaintiff's property, the comparables upon which such value is based, whether the property has been in any way impaired, and the reason for the impairment. The affidavit must further specify

the amount of the impairment; whether such impairment is based on any actual loss of the use and enjoyment of the property; and the facts underlying such loss. The affidavit shall further state the methodology for calculating the value of each Plaintiff's property, and the methodology for calculating the amount of the impairment. The failure of any Plaintiff to comply with this paragraph may result in his or her claims for injury to property being dismissed.

6. Du Pont is to have from June 1, 1993 through July 31, 1993 to complete its appraisals of the properties of all Plaintiffs who have indicated their interest in continuing to assert their property damage claims by compliance with the preceding paragraph. The failure of any Plaintiff to cooperate with Du Pont's efforts to comply with this paragraph may result in his or her action being dismissed. On or before August 15, 1993, Du Pont is to provide Plaintiffs with all such appraisals, and file with the Court and provide Plaintiffs with the affidavit of a qualified real estate appraiser, specifying the value of each Plaintiff's property, the comparables upon which such value is based, whether the property has been in any way impaired, and the reason for the impairment. The affidavit must further specify the amount of the impairment; whether such impairment is based on any actual loss of the use and enjoyment of the property; and the facts underlying such loss. The affidavit shall further state the methodology for calculating the value of each Plaintiff's property, and the methodology for calculating the amount of the impairment. The failure of Du Pont to comply

with this paragraph may result in its being precluded from introducing evidence on this issue at trial.

7. Plaintiffs are to have until July 31, 1993 to consult with competent expert witnesses and conduct scientific testing to determine the costs of cleaning up their properties or otherwise restoring the properties' value. On or before August 15, 1993, Plaintiffs are to provide Du Pont with all results, analyses, conclusions, and other data, and file with the Court and provide Du Pont with the affidavit of a competent expert witness specifying the actions each Plaintiff intends to conduct to clean up his property. The affidavit must specify a timetable for completion of the clean-up, an estimate of the costs of the clean-up, and the methodology for calculating the clean-up costs. The failure of any Plaintiff to comply with this paragraph may result in his or her claims for recovery of clean-up costs being dismissed.

8. Du Pont is to have from September 1, 1993 through October 31, 1993 to consult with competent expert witnesses and conduct scientific testing to determine the costs of cleaning up or otherwise restoring the value of the properties of all Plaintiffs who have complied with the preceding paragraph. The failure of any Plaintiff to cooperate with Du Pont's efforts to comply with this paragraph may result in his or her action being dismissed. On or before November 15, 1993, Du Pont is to provide Plaintiffs with all results, analyses, conclusions, and other data, and file with the Court and provide Plaintiffs with the affidavit of a competent expert witness specifying the necessity of any action each Plaintiff intends to conduct to clean up his

property. The affidavit must specify a timetable for completion of any clean-up, an estimate of the costs of such a clean-up, and the methodology for calculating the clean-up costs. The failure of Du Pont to comply with this paragraph may result in its being precluded from introducing evidence on this issue at trial.

9. Plaintiffs are to have until May 31, 1993 to consult with and be examined by physicians, psychiatrists, psychologists, and any other health care providers regarding Plaintiffs' claims of potential future harm to their health, fear of harm to their health, stress, anxiety, or other emotional harm, or any other personal injury. On or before June 15, 1993, Plaintiffs are to provide Du Pont with all results, analyses and other data, and file with the Court and provide Du Pont with a physician's affidavit specifying the nature, duration, and amount of exposure (including blood levels) each Plaintiff has had to chemical contamination, when such exposure occurred, and the nature and extent of each such Plaintiff's personal injury. The physician's affidavit may be supplemented with the affidavits of other competent expert witnesses, but submission of such supplementary affidavits will not excuse the failure to submit the physician's affidavit, including the required contents, described in this paragraph. The physician's affidavit shall state his or her opinion, based on a reasonable degree of medical certainty, that the particular Plaintiff has suffered injuries as a result of exposure to chemicals from Kentec Inc.; shall specify any and every injury, illness or condition suffered by the Plaintiff that, in the opinion of the physician, was caused by the alleged exposure; shall specify the chemical or chemicals that, in the

opinion of the physician, caused each and every specific injury, illness, and condition listed; shall include differential diagnoses which rule out alternative possible causes of Plaintiffs' injuries; and shall state the scientific and medical bases for the physician's opinions. With regard to future personal injury, the affidavit shall state the physician's opinion, based upon a reasonable degree of medical certainty, that the particular Plaintiff is more likely than not to suffer a particular injury in the future; shall identify such specific injury; shall state the time at which such future injury shall manifest itself; and shall comply with the remaining requirements of this paragraph as if the injury currently existed. The failure of any Plaintiff to comply with this paragraph may result in his or her claims for personal injury being dismissed. See Attachment A for this court's opinion in overruling the plaintiffs' written objection to paragraph 9

CKM/A.

10. Du Pont shall have from July 1, 1993 through September 30, 1993 to complete its examinations, through physicians, psychiatrists, psychologists and any other health care providers, of all Plaintiffs who have indicated their interest in continuing to assert claims of potential future harm to their health, fear of harm to their health, stress, anxiety, or other emotional harm, or any other personal injury by compliance with the preceding paragraph. The failure of any Plaintiff to cooperate with Du Pont's efforts to comply with this paragraph may result in his or her claims for personal injury being dismissed. On or before October 15, 1993, Du Pont is to provide Plaintiffs with all results, analyses and other data, and file with the Court and provide Plaintiffs with a physician's affidavit stating whether such a Plaintiff has been injured through exposure to any

chemicals involved in this litigation, and specifying the nature, duration, and level of exposure (including blood levels) each Plaintiff has had to chemical contamination, when such exposure occurred, and the nature and extent of each such Plaintiff's personal injury. The physician's affidavit may be supplemented with the affidavits of other competent expert witnesses, but submission of such supplementary affidavits will not excuse the failure to submit the physician's affidavit, including the required contents, described in this paragraph. The physician's affidavit shall state his or her opinion, based on a reasonable degree of medical certainty, whether the particular Plaintiff has suffered injuries as a result of exposure to chemicals from Kentec Inc.; shall specify any and every injury, illness or condition suffered by the Plaintiff that, in the opinion of the physician, was caused by the alleged exposure; shall specify the chemical or chemicals that, in the opinion of the physician, caused each and every specific injury, illness, and condition listed; shall include differential diagnoses which rule out alternative possible causes of Plaintiffs' injuries; and shall state the scientific and medical bases for the physician's opinions. With regard to future personal injury, the affidavit shall state the physician's opinion, based upon a reasonable degree of medical certainty, whether the particular Plaintiff is more likely than not to suffer a particular injury in the future; shall identify such specific injury; shall state the time at which such future injury shall manifest itself; and shall comply with the remaining requirements of this paragraph as if the injury currently existed. The failure of Du Pont to comply with

this paragraph may result in its being precluded from introducing evidence on this issue at trial.

11. Plaintiffs are to have until June 30, 1993 to consult with competent expert witnesses regarding Plaintiffs' claims of inconvenience, annoyance, and damage to quality of life resulting from the alleged contamination of their properties. On or before July 15, 1993, Plaintiffs are to provide Du Pont with all results, analyses, conclusions, and other data, and file with the Court and provide Du Pont with the affidavit of a competent expert witness specifying the nature, duration, and level of such harm each Plaintiff has suffered. The failure of any Plaintiff to comply with this paragraph may result in his or her claims for such injuries being dismissed.

12. Du Pont shall have from August 1, 1993 through September 30, 1993 to complete its examinations, through competent expert witnesses, of all Plaintiffs who have indicated their interest in continuing to maintain claims for inconvenience, annoyance, and damage to quality of life resulting from the alleged contamination of their properties by their compliance with the preceding paragraph. The failure of any Plaintiff to cooperate with Du Pont's efforts to comply with this paragraph may result in his or her claims for such injuries being dismissed. On or before October 15, 1993, Du Pont is to provide Plaintiffs with all results, analyses, conclusions, and other data, and file with the Court and provide Plaintiffs with the affidavit of a competent expert witness specifying the nature, duration, and level of such harm each Plaintiff has suffered. The failure of Du Pont to comply with this paragraph may result

in its being precluded from introducing evidence on this issue at trial.

13. This Court will schedule a conference with the parties during the month of September 1993 to monitor the progress of discovery, and determine whether modification of this order is appropriate.

14. Plaintiffs shall have until April 12, 1993 to file their Motion to Consolidate all actions for trial.

15. All discovery is to be completed by December 31, 1993.

16. The stay in effect on Du Pont's two pending summary judgment motions filed in actions 91-57-CIV-4-H and 91-60-CIV-4-H shall automatically lift on December 31, 1993, unless otherwise ordered.

17. All pre-trial motions shall be filed by February 28, 1994, with all responses filed by March 31, 1994. All replies, if necessary, shall be filed within ten days thereafter.

18. A pre-trial conference shall be scheduled in early June 1994 before Magistrate Judge Charles K. McCotter, Jr. in New Bern, North Carolina.

19. Trial shall be scheduled for the Honorable Malcolm J. Howard's first July 1994 term, with court to be held in New Bern, North Carolina.

ORDER ENTERED, this 17th day of February, 1993.

Charles K. McCotter Jr.
CHARLES K. McCOTTER, JR.
United States Magistrate Judge

I certify the foregoing to be a true and correct copy of the original
[illegible]
Eastern District of North Carolina
By: [illegible] Deputy Clerk

Attachment A

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF NORTH CAROLINA
NEW BERN DIVISION
NO. 91-55-CIV-4-H

Filed in All Pending Du Pont Litigation

EDWARD B. GRANT, and wife,
JANICE C. GRANT,

Plaintiffs

v.

E. I. DU PONT DE NEMOURS AND
COMPANY, INCORPORATED,

Defendant

O P I N I O N

Subsequent to the hearing at which the court adopted the defendant's proposed case management order, the plaintiffs objected to three parts of the order. The objection to the last sentence of the first paragraph is OVERRULED. The objection to the second full paragraph on page two is SUSTAINED. The objection to paragraph nine is OVERRULED.

The court would like to take this opportunity to elaborate on the reasons for overruling the plaintiffs' objection to paragraph nine. Plaintiffs object to the requirement of physician affidavits rather than expert affidavits for the emotional distress claims. The plaintiffs contend that this appears to imply or impute a requirement of physical injury for an emotional distress claim.

In North Carolina, physical injury is not required to be shown to succeed on an emotional distress claim. In North Carolina, the essential elements of a claim for negligent infliction of emotional distress are "(1) the defendant negligently engaged in conduct, (2) it was reasonably foreseeable that such conduct would cause plaintiff severe emotional distress . . ., and (3) the conduct did in fact cause . . . severe emotional distress." Johnson v. Ruark Obstetrics, 323 N.C. 283, 304, 395 S.E.2d 85, reh'g denied, 327 N.C. 644, 399 S.E.2d 133 (1990). The elements and standard for a claim for relief for infliction of emotional distress are the same whether it was negligent or intentional. Waddle v. Sparks, 331 N.C. 73, 83, 414 S.E.2d 22 (1992).

Further, there is no requirement of a showing of a diagnosable mental or emotional condition. Severe emotional distress means:

> [A]ny emotional or mental disorder, such as, for example, neurosis, psychosis, chronic depression, phobia or any other type of severe and disabling emotional or mental condition which may be generally recognized and diagnosed by professionals trained to do so.

Johnson, 327 N.C. at 304; Waddle, 331 N.C. at 83.

The severe emotional distress element requires a high standard of proof. In Waddle, the North Carolina Supreme Court said

> Support for a high standard of proof on the severe emotional distress element can also be found in the second Restatement of Torts, from which we have derived most of our present standards for the remaining elements of intentional infliction of emotional distress. The rule stated in this section applies only where the emotional distress has in fact resulted, and where it is severe. Emotional distress passes under various names, such

> as mental suffering, mental anguish, mental or nervous shock, or the like. It includes all highly unpleasant mental reactions, such as fright, horror, grief, shame, humiliation, embarrassment, anger, chagrin, disappointment, worry, and nausea. It is only where it is extreme that the liability arises. Complete emotional tranquility is seldom attainable in this world, and some degree of transient and trivial emotional distress is a part of the price of living among people. The law intervenes only where the distress inflicted is so severe that no reasonable man could be expected to endure it. The intensity and duration of the distress are factors to be considered in determining its severity. . . . It is for the court to determine whether on the evidence severe emotional distress can be found; it is for the jury to determine whether, on the evidence, it has in fact existed.

331 N.C. at 83-84.

Waddle does not require an actual medical diagnosis or medical treatment as a matter of law before a claim of emotional distress may be submitted to the jury. In Waddle the court adopted the test laid down in Johnson, 327 N.C. at 304, requiring either medical documentation of "severe emotional distress" or other evidence of "severe and disabling" psychological problem. Waddle, 331 N.C. at 85. Where a plaintiff has presented sufficient evidence of "severe and disabling" psychological problems for some period of time subsequent to the triggering event, neither Waddle nor Johnson require medical diagnosis or treatment.

Accordingly, the inclusion of paragraph nine in the case management order does not imply or impute a requirement of physical injury for an emotional distress claim. However, the court has no

problem with the plaintiffs producing an affidavit from a competent expert witness specifying the nature and extent of each plaintiff's emotional injuries in connection with paragraph nine of the case management order in addition to or in lieu of that of a physician. The defendants may have the same prerogative under paragraph ten of the case management order in respect to emotional distress claims.

OPINION ENTERED, this 17th day of February, 1993.

CHARLES K. McCOTTER, JR.
United States Magistrate Judge

R-12003-K REV. 8-90

November 1992 sampling event

ESTABLISHED 1802

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
KINSTON PLANT
P.O. BOX 800
KINSTON, NORTH CAROLINA 28502-0800
PHONE (919) 522-6111

February 15, 1993

FIBERS DEPARTMENT

Mr. Willie A. Hardison
Div. of Environmental Management
Groundwater Section
P. O. Box 1507
Washington, NC 27889

SUBJECT: Permit No. WQ0005906
E. I. du Pont de Nemours & Co., Inc.
Kentec Site, SIC Code No. 7399
Groundwater Remediation System
Lenoir County

Dear Mr. Hardison:

Pursuant to requirements of the subject permit, here are the data for the specified time frames. If there are any questions, please give me a call on (919) 522-6263.

Sincerely,

J. D. Henderson, Manager
N.C. Environmental Affairs

JDH/jkj

Attachment

CH2M HILL

MEMORANDUM

TO: **Jerry Henderson/Du Pont**

FROM: **Doug Dronfield/CH2M HILL**

DATE: **February 4, 1993**

SUBJECT: **Kentec Quarterly Groundwater Data and Monthly Railcar Data**

Enclosed are the quarterly groundwater monitoring data results(August through November 1992), the railcar concentrations, and monthly railcar average concentrations for the same time period(August through November 1992). The submittal of this data to the state complies with Section II.2. of the June 17,1992 Groundwater Remediation Permit.

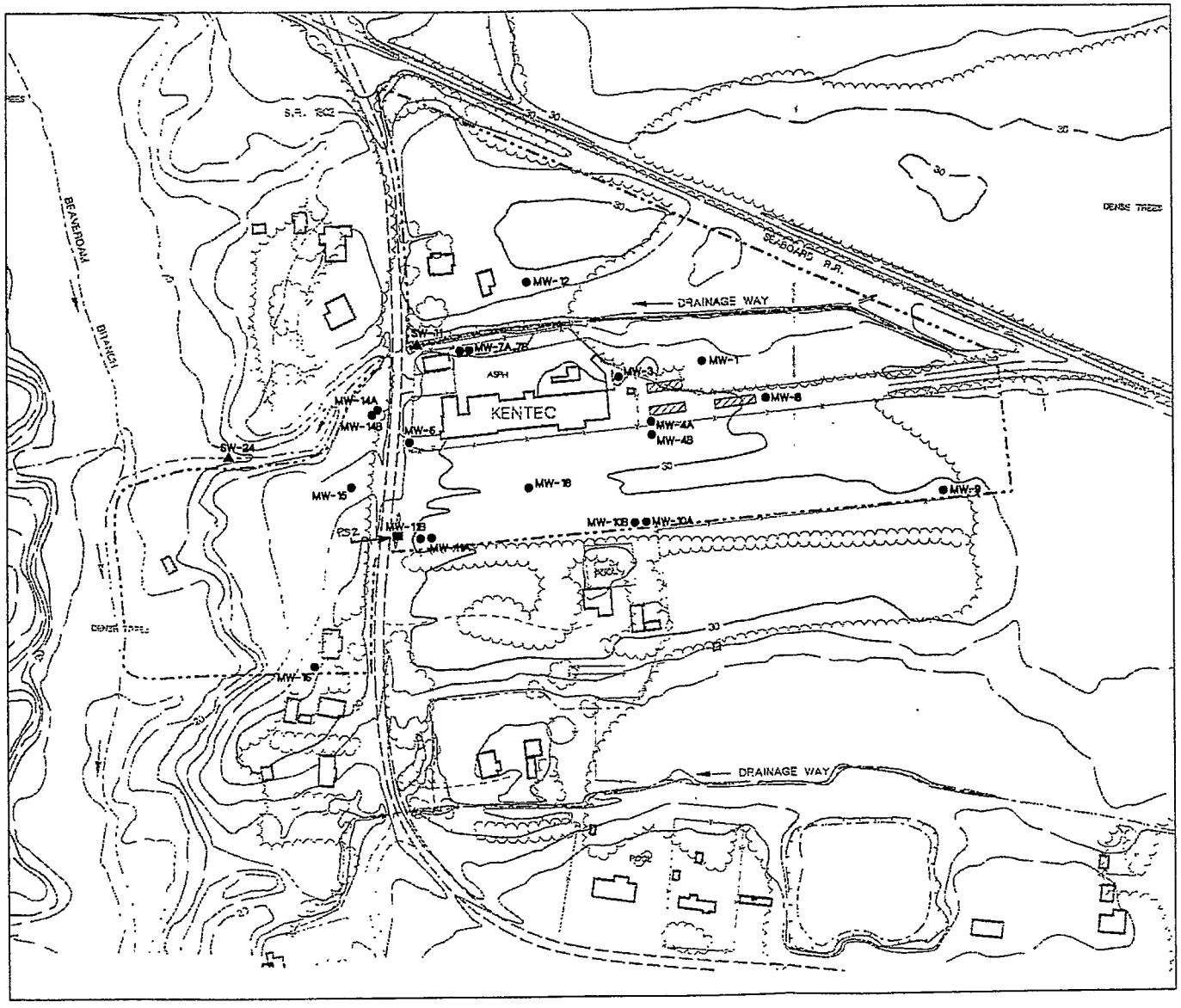
The railcar data (effluent from the groundwater treatment plant) are well within the limits established by in the permit (Section I.27.).

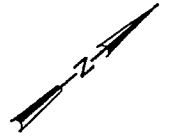
Kentec Groundwater Treatment Facility
August - November, 1992

Railcar Identification Code	Date	Time	DCE (ppb)	DCA (ppb)	1,4 Dioxane (ppb)
	August				
Railcar 34064	3	815	<5	17	<100
Railcar 94041	6	815	<5	16	<100
Railcar 94041	13	1045	<5	9	<100
Railcar 34064	19	745	<5	9	<100
Railcar 34064	21	800	<5	<5	<100
Railcar 94041	24	815	<5	<5	130
Railcar 34064	27	730	<5	<5	<100
Railcar 94041	28	820	<5	<5	<100
Monthly Average			**<5**	**8.9**	**103.8**
	September				
Railcar 34064	8	745	<5	<5	<100
Railcar 94041	11	730	<5	<5	<100
Railcar 34064	15	800	<5	<5	<100
Railcar 94041	18	700	<5	<5	<100
Railcar 34064	21	715	<5	<5	<100
Railcar 94041	25	700	<5	<5	<100
Railcar 34064	28	730	<5	<5	<100
Monthly Average			**<5**	**<5**	**<100**
	October				
Railcar 94041	1	730	<5	6	<100
Railcar 34064	5	700	<5	<5	<100
Railcar 94041	9	700	<5	<5	<100
Railcar 34064	12	730	<5	<5	<100
Railcar 94041	16	730	<5	<5	112
Railcar 34064	19	730	<5	<5	<100
Railcar 94041	22	730	<5	6	<100
Railcar 34064	23	715	<5	<5	<100
Railcar 94041	26	730	<5	<5	<100
Railcar 34064	30	730	<5	<5	172
Monthly Average			**<5**	**5.2**	**108.4**
	November				
Railcar 94041	2	700	<5	<5	<100
Railcar 34064	5	730	<5	<5	<100
Railcar 94041	9	715	<5	<5	<100
Railcar 34064	12	730	<5	<5	<100
Railcar 94041	15	730	<5	<5	<100
Railcar 34064	25	730	<5	5	<100
Railcar 94041	28	830	<5	<5	<100
Monthly Average			**<5**	**5**	**<100**

Kentec Quarterly Groundwater Data
November 1992
All Concentrations are PPB

Well Number	Date	1,1-Dichloro-ethene	1,1-Dichloro-ethane	1,4-Dioxane
MW-1	11/92	< 7	< 7	< 150
MW-3	11/92	42	< 7	860
MW-4A	11/92	19	100	1400
MW-4B	11/92	< 7	< 7	< 150
MW-6	11/92	< 7	< 7	11000
MW-7A	11/92	26	8.4	3600
MW-7B	11/92	< 7	< 7	< 150
MW-8	11/92	< 7	28	< 150
MW-9	11/92	< 7	< 7	< 150
MW-10A	11/92	< 7	8.9	< 150
MW-10B	11/92	< 7	< 7	< 150
MW-11A	11/92	9.1	64	< 150
WM-11B	11/92	< 7	< 7	< 150
MW-12	11/92	< 7	< 7	< 150
MW-14A	11/92	< 7	7.3	960
MW-14B	11/92	< 7	< 7	< 150
MW-15	11/92	9.5	< 7	180
MW-16	11/92	< 7	< 7	< 150
MW-18	11/92	< 7	< 7	< 150
SW-11	11/92	< 7	7.4	< 150
SW-24	11/92	< 7	< 7	< 150
PS-2	11/92	9.2	34	< 150





LEGEND

- ● MONITORING WELL
  'A'- MONITORING WELLS ARE IN THE SHALLOW AQUIFER
  'B'- MONITORING WELLS ARE IN THE PEEDEE AQUIFER
- ▲ SURFACE WATER MONITORING POINT
- ■ TRENCH SAMPLING POINT

NOTE: BASE MAP COMPILED FROM AERIAL PHOTOGRAPHY FLOWN ON 2/10/89.

0 100 200 300

SCALE: 1"=200'

Figure 5-1

COLLECTION TRENCH MONITORING SYSTEM
Du Pont Kentec Facility

CH2M HILL

2398/057.dgn 6-JUL-1991

State of North Carolina
Department of Environment, Health and Natural Resources
Northeastern Region
1424 Carolina Avenue, Washington, North Carolina 27889-1424

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Lorraine G. Shinn
Regional Manager

TO WHOM IT MAY CONCERN:

Under the Freedom of Information Act, I hereby request access to the Dupont/Kentech file (GW Incident #6334).

I make this request on behalf of and as an agent of _____

Vernon G. Snyder III. Thank you for your cooperation.

Signed: Sara Lanyard Date: 7/23/92

P.O. Drawer 545
(Address)

Greenville, NC 27835